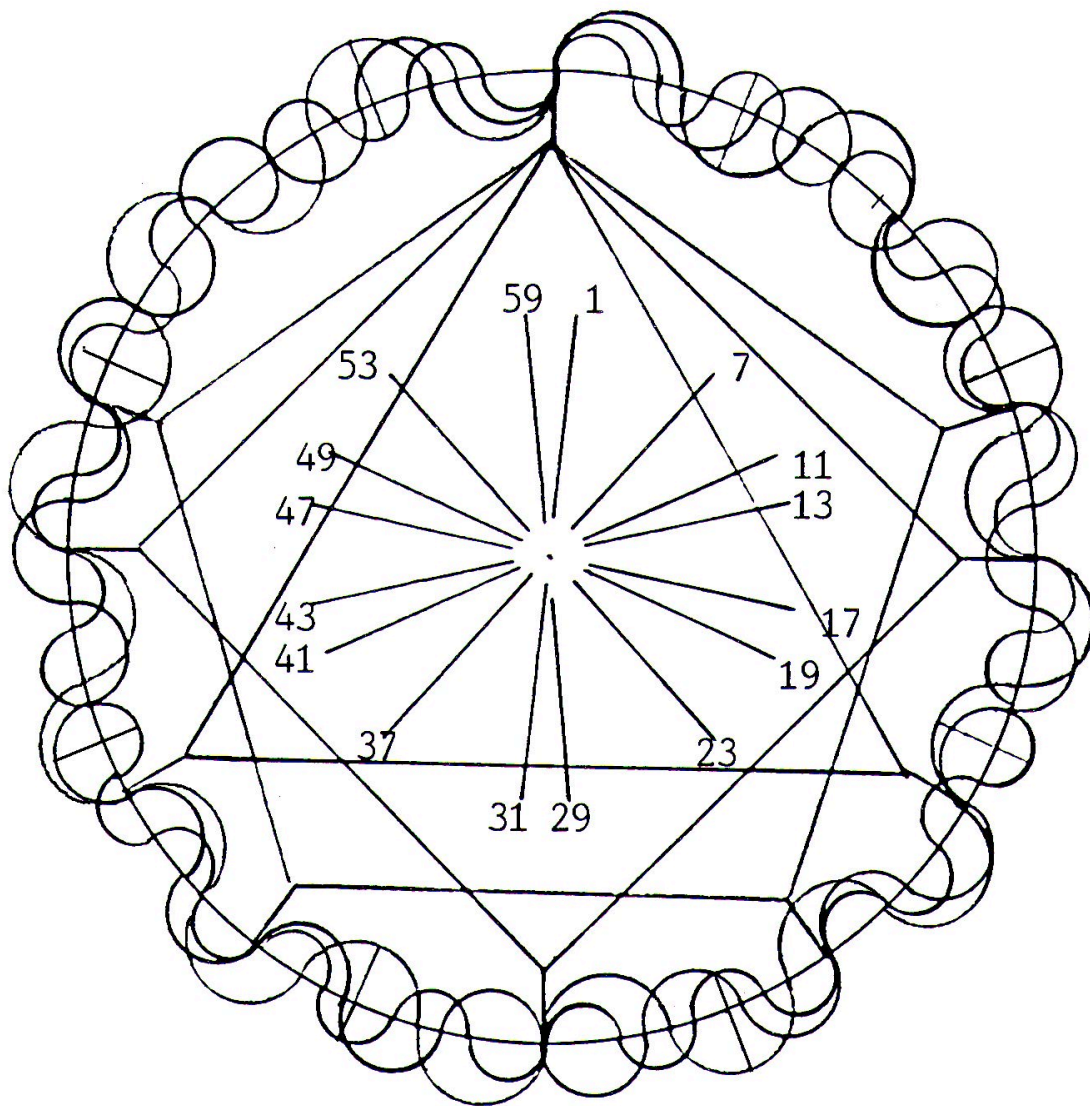


# Quantum Arithmetic

Volume II  
Books 3 & 4  
New Wave Theory  
Synchronous Harmonics  
by

Ben Iverson  
February, 1991  
(long lost book - now found 11/10/05)



## **Quantum Arithmetic - Volume II**

Books 3 & 4

New Wave Theory - Synchronous Harmonics

by Ben Iverson

February, 1991

(long lost book - now found 11/10/05)

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Ben Iverson also authored:

Foundation of Science

Global Geometry

Great Flood Mystery

Pythagoras and the Quantum World - Vol. I

Pythagoras and the Quantum World - Vol 2

Pythagoras and the Quantum World - Vol 2 revised

Pythagoras and the Quantum World - Vol 3 Enneagram

Pythagoras and the Quantum World - Vol. II

QA-1 Natural Arithmetic

QA-2 Natural Arithmetic

QA-3 Natural Arithmetic

Quantum Arithmetic - 1 & 2

Quantum Arithmetic - Book 3 & 4 - New Wave Theory - Synchronous Harmonics

Quantum Arithmetic 2nd Keely Conference

Quantum Arithmetic 2nd Keely Conference

Quantum Arithmetic 3rd Keely Conference

Quantum Arithmetic 3rd Keely Conference

Quantum Arithmetic Reference

Synchronous Harmonics

and numerous articles. Some are located here:

<http://www.svpvril.com/svpweb17.html>



## Quantize Code

optimized by Dale Pond for HyperCard but will run in Revolution with minimal modification.

on mouseUp

set cursor to watch

```
put "" into background field b
put "" into background field e
put "" into background field d
put "" into background field a
put "" into background field bb
put "" into background field ee
put "" into background field dd
put "" into background field aa
put "" into card field id 42
put "" into card field id 43
put "" into field id 20
```

```
if card field Jo 1 th en
  ask "Please enter decimal only"
  put it into card field Jo
end if
```

```
put (10000) into xxk
put card field Jo into x1
put the value of x1*10000 into xxj
put (xxk-xxj)/2 into xxc
put (xxk + xxj)/2 into xxd
put xxd^.5 into xd
put xxj/xd into xb
put xxc/xd into xe
put xxk/xd into xa
put 1/xd into ratio
put ratio*xb into b
put ratio*xe into e
put ratio*xd into d
put ratio*xa into a
put (0) into xx1
put 0.00005 into x2 --allowed empirical error
```

--FIND QUANTUM RATIO: (Euclid 7,28)

--EXPAND EMPIRICAL SQUARE TO QUANTUM SQUARE

```
repeat while xy <> yx
  put xx1 + 1 into xx1
  put xx1 into field id 11
  put ratio into x
  put xx1 * b into bb
  put xx1 * e into ee
  put xx1 * d into dd
  put xx1 * a into aa
  put abs(round(aa + 0.5 - x2)) into xy
  put abs(round(aa - 0.5 + x2)) into yx
  if xy = yx then
    exit repeat
  end if
```

next repeat  
end repeat

--CHECK PRIMENESS (Euclid 7,1)

```
put abs(round(bb)) into bbb
put abs(trunc(xy)) into ddd
Repeat until bbb=ddd
  put abs(ddd) into field id 9
  put abs(bbb) into field id 8
  If ddd>bbb then
    put ddd-bbb into ddd
  end if
  If bbb>ddd then
    put bbb-ddd into bbb
    put bbb into field id 12
    put ddd into field id 13
    next repeat
  end if
  put bbb into field id 12
  put ddd into field id 13
  if bbb=1 and ddd =1 then
    put bbb into field id 14
    put ddd into field id 15
    exit repeat
  end if
end repeat
```

--SET SUM & DIFFERENCE: (Fibonacci- Dio-  
phantus)

```
put abs(round((dd)/(ddd))) into field id 10
put abs(trunc(xy))/(bbb) into field id 11
put abs(trunc(field id 11 - field id 10)) into
field id 9
put abs(trunc(field id 10 - field id 9)) into
field id 8
```

--EXTEND SERIES: (Rhind Mathematical Pa-  
pyrus)

```
put trunc(field id 11) into card field id 42
put card field Jo into x1
put the value of x1 * card field id 42 into
card field id 43
put round(card field id 43) into card field id
43
put card field id 43/card field id 42 into field
id 20
put abs(field id 11) into field id 12
put abs(field id 9 * field id 10) into field id 14
put abs(field id 14 - field id 12) into field id
13
put field id 13 + field id 14 into field id 15

end mouseup
```

# INTRODUCTION

Additional background for Books #3 and #4 is given in Volumes I, II, & III, of *"Pythagoras And The Quantum World"*, (1982-1986).

Volume I should be a prerequisite for this volume, but the reader will derive some idea of general goals to be reached.

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# Quantum Arithmetic

## ILLUSION

This chapter should have occurred much earlier in these texts in order to clear the air. But having gone this far, perhaps the reader can more benefit from these thoughts by this time.

Surely Quantum Arithmetic is a difficult subject, not that it is difficult in itself but because of ingrained thought patterns of the student who is trying to understand. Quantum Arithmetic is NOT the ordinary mathematics which it seems to be. This is the GRAND UNIFIED FIELD and it derives from ancient mathematics.

In the past text, I have refrained from criticizing contemporary science and scientific methods because that would be counter productive. But let me review the present status of science:

(1) Every scientifically inclined person is amazed at the progress we have made, and it is phenomenal with our entry into space; Our development of the atomic bomb, and atomic power; With our development of laser and diodes; Our state of the art in computers, and so many other areas. But we have become insolent in thinking this is all there is. How little do we really know? It is about ten percent of what every person should be able to understand.

(2) There is absolutely no area which is not fraught with dangers of accident. We have literally built our scientific institution on a foundation of sand, and even today we can begin to see it crumble away. Those little things we have ignored have come into primary importance. We have become conceited with our progress.

(3) We have overlooked those small trivialities and made our discoveries only part way. With the Superconducting Super Collider, (SSC) we are like little a boy who receives new electric train set for his birthday. With the superconducting Super Collider, the scientists will be pushing around atomic particles instead of railway cars. They will see magnetic controls for their railroad track. In this case they are using a twenty pound maul to drive a carpet tack. The work they are trying to accomplish can be done more effectively with precisely controlled harmonics. Certain few scientists are beginning to do just that today.

(4) In overlooking the trivialities, on which Quantum Arithmetic is based, chemistry alone is capable of destroying the habitability of Earth. It is presently destroying the ozone protective zone in the stratosphere. This occurs only because we have overlooked some of the minor radiative prop-

erties of the halogens, and particularly chlorine. It has been necessary to outlaw the use of carbon tetrachloride, and trichloro ethylene. Chlorine is a male (radiative) element and it goes out of its way searching for trouble to cause. It's antigen is sodium and potassium, the two main counteractive female (attractive) agents.

(5) The word "Quantum" is overworked and misused. It has become a hype word surrounded with mysticism. Look in a dictionary for the definition of Quantum. No two of them are alike, and each one goes to great ends. The definition was given earlier. Quantum means only: "BASED ON WHOLE NUMBER VALUES." It means neither more or less but it does require a working knowledge of prime numbers because primeness or co-primeness must be maintained in some composite numbers are required.

(6) Everything created by nature is quantum. A particular case is a cogwheel or a gear train. It is based upon the variations found within the prime number system. Each gear wheel can be reduced to its prime number of gear teeth, or the prime factors of number of gear teeth. In getting away from this in our human creations, we have created a system of chaos. There is literally nothing in human creation, which is quantum. Laser is one major exception and that is because we have, unknowingly, used the quantum numbers of the natural energy states of the atoms. We could do much better in creating crystals if we would better understand the quantum formation of various crystals.

(7) In mathematics we have become far too complex. It takes a lifetime to learn contemporary mathematics and it is all chaos in the end. Quantum Arithmetic becomes the essence of simplicity and it attains absolute accuracy. The numbers essentially stop with 1, 2, 3, 5, 6 & 7. (Pythagoras said to 10). The higher prime integers, 11 and 13, come into play in a secondary role. Stopping at 7, we can then continue to 16, and just short of 17, just as Pythagoras claimed. The numbers 2, 3, 5 and 7 will carry us to 16. ( $16 = 2^4$ ;  $15 = 3 \times 5$ ;  $14 = 2 \times 7$ ;  $12 = 3 \times 2^2$ ;  $10 = 2 \times 5$ ;  $9 = 3^2$ ; and  $8 = 2^3$ .) These use only the integers up to 7, leaving out 11 and 13 which play only a secondary role.

To support Pythagoras, remember that  $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$ . But at the same time  $7 \times 8 \times 9 \times 10 = 5040$  also. This is truly a magic number in Quantum Arithmetic.

After 16, the next stopping place for secondary prime integers is somewhat less than 97. The tertiary integers, which are all composite integers,

## Quantum Arithmetic

stop at 10,000, and absolutely no higher integers are needed. This will be explained in the following chapters. This list could go on to area after area in all of science, but let us get into a more positive mode.

We have not recognized that everything in nature, (but not in human constructions), from electrons to galaxies conform to absolute quantum laws. From electrons to galaxies includes only matter. But energy is the parent of matter, not the other way around. Energy also has other children. One of them is audible sound and another is visible light. And it appears there may be at least five other children which we are yet to discover. Quantum Arithmetic will lead the way.

Once a person recognizes that energy is all that really exists in nature, we begin to make headway. Everything else is made from energy. Matter is made from positive energy, for protons, negative energy, for electrons, and there are lesser details. All of our current scientific discovery pertains to matter in some way or another, yet matter itself is less than ten percent of the whole energy spectrum. It can be estimated that we have broken into nature to glean less than five percent of the information which can be available. Most of that is faulty and incomplete in one way or another.

Beginning with energy, everything in nature is precise, and exact. This is made possible through quantum laws. It is a precision which we can never attain unless we use the mechanisms which nature has provided. We have done that, (unknowingly), in the case of laser. Frequencies, must be accurate within millionths of one hertz. In most places we need to produce accuracy, to 0.0001 of one hertz. Our human produced frequencies are not that accurate and therefore human produced things can almost never be quantum. That is the difference between conventional science and quantum science.

With the array of ten thousand quantum values between two sequential hertz values there will be a quantum value which nearly matches our produced values. But nearly, is not close enough. This will be explained more fully in the remaining chapters of this volume. It must be absolutely correct. That's what Quantum Arithmetic can determine, first through quantizing and secondly by finding the prime factors of the quantum numbers.

For instance, say we are making the gears for a clockworks. We make the teeth on the gears precise from beginning to the end of a gear wheel. At

the last tooth we find that we have a part of a space left over between the last tooth and the first because the diameter of the blank wheel was slightly over or under. It is possible to make such a gear operate by applying enough power to force it over this obstacle. It will damage the gear, but it will never truly wear in if both gears have a prime number of teeth. In this case, every tooth on one gear will eventually mate with every tooth on the other gear. That is what quantum is all about.

This seems such a trivial thing. But if we do not consider all such trivialities we cannot, ever achieve quantumness in our constructions. The values must be absolute, and must be discrete. Only integer values can be used.

### TO BE PRIME

Considering integer values, some number theory, (or rather Quantum law), must be considered. When is a number a prime number?

In Quantum Arithmetic, every number is prime to certain others. Every integer is prime to any integer which is one unit less or one more than itself.

Every integer is prime to any integer which is two units more or two units less than itself, provided the original number is not divisible by two.

Every integer is prime to any integer which differs from itself by a prime number. This can be taken as a corollary to Euclid VII, Proposition 28. In this way, two integers will be prime or coprime, to each other. Euclid expands this to 4 integers. Book VII, Proposition 28 states that the sum and the difference between two coprime integers will be prime to both of them. This creates the four integer sequence which has been called the "quantum number". Coprimeness is one of the qualities which is required of quantum numbers.

Most readers lapse into unreality when it is claimed that Quantum Arithmetic is based on understandings of the ancients. There are many ancient beliefs that dwell on the trivialities and the philosophical knowledge that they gleaned from them in an analogous way. Plato claimed that life to death to rebirth was an analog to wakefulness, to sleep, to reawakening. This was derived from mathematical attributes.

When the reader reads such passages, it brings visions of mysticism, and the unreal. But is anything which is not readily understandable also mystical or unreal? When a missionary produces a mirror to an aborigine, or fire from a

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match, is that mystical? To us, no, but to the aborigine it is mystical. Is it unreal? No it is real to both us and the aborigine because it can be observed in occurring in the material realm. It is not illusion. Only our interpretation may be illusion. In the case of Quantum Arithmetic, reality can be demonstrated in pictures and diagrams but mathematics is not in the realm of matter. We can understand it only in the sense of abstract logic and not with our normal senses. It is abstract number, but can be used in relation to matter or any other natural thing such as music, forces, or energy. It is not mystic, just because we cannot put our hands on it. We are familiar with numbers, but here they are put in a different context concerning the relationships between specific numbers.

Relationships have been used repeatedly in connection with engineering and design, but only in a way of relative values. In Quantum Arithmetic we can begin to attribute physical relationships in a generalized way. When relationships have been tested against our familiar knowledge and correlations have been found, it is no longer mystical. It is now metaphysical, which means it is beyond our tangible senses, because it has been disconnected from matter, per se. Our senses pertain only to matter and material things.

Because we can approach Quantum Arithmetic only mentally, does not mean that it is unreal. Having a science that is limited to the realm of matter, being less than ten percent of the energy spectrum, we have learned many things in science which are not entirely true or complete. What in our knowledge which is untrue, must be disremembered. What is incomplete must be completed. That's the crux of our difficulties with Quantum Arithmetic.

One more thing which can enhance our belief in Quantum Arithmetic: Many of the relationships have been generalized to an extent they create the "exceptions" to every rule. Quantum Arithmetic overcomes the many "exceptions" which science has had imposed upon it. The limitations of science to things material, has previously prevented making these generalizations. Now that the generalizations can be made we find minor and major errors in definitions within science. Correcting these definitions, as we have corrected the definition of quantum numbers, clears the way for further progress.

Here in Book 3 is found a major revision in wave theory. The mathematical background of harmonics, now being known, allows us to make creations without the previously unwanted harmonics. Potential harmonics can now be exposed

mathematically. Our designs can now be more precise, more efficient, and more durable.

Attempts have been made to simplify the frame work of writing these texts. The attempt has been made to make these texts readable and understandable to the lay public. Discussions have been reduced to a low denominator, even though that creates extra length to the text. Most abbreviations have been eliminated to avoid confusion and to improve understanding. It is hoped it will make these accessible to the general mass of readers.

There are those who distrust and fear science on the one hand, and those who think our present science is already completely known on the other. It is hoped that this is accessible to them both. But if their mental processes are so crystallized they cannot absorb the message, so be it. Let science again become a subject in which the general public can participate.

There are many between these two extremes who have hope and a faith in the future for our children. And there are thousands working to build that future. It is hoped these pages will make this accessible to them and to the general mass of readers, and who are interested in new items of scientific knowledge with which to build that future.

This new beginning need not be made with confusion and chaos while we clear away the old misconceptions. The old theories and hypotheses must be reviewed. In some cases they must be abandoned altogether. In most cases they need only revision. Let the original experiments be re-performed in this new light, when so indicated, and the new interpretations formulated.

Gradually we should begin to see the new light of day, and the new age will be upon us. The following chapters will enter what so many have called metaphysics, and others have called mystic areas. They are mystical only to those who do not understand the beginnings laid down in these texts. Those mystical areas have a rationale. We must go beyond the world of matter in order to understand it.

The following chapters will go beyond the world of matter and our perception of matter through our senses. Using the information which was put forth in the previous volume of Quantum Arithmetic, we will deal with its dynamics. The dynamics of numbers, through Synchronous Harmonics builds a bridge or understanding energy as we find it in the physical world.



## Quantum Arithmetic

The present decay and chaos which is occurring in contemporary science makes it mandatory that we go back to our foundations in mathematics and connect those quantum foundations to what we know and can prove correct in current scientific theory. There must be corrections made to those theories which were derived from faulty interpretation of experimental results.

When this is done, we will find that many of the exceptions which presently appear, will dissolve into thin air. Some of these corrections have already been suggested, and some will be described in the following chapters.

Chemistry presents an opportunity to make a constructive change with our new found ability to quantize all energy states of all atoms of any element. This, in turn, teams up with what we know about music or to develop new chemical compounds and the possibility of knowing beforehand the characteristics of those compounds even before they are produced.

Work is in progress for the redevelopment of the musical scale for Music of the Spheres as described in ancient legends and texts. Along with this we find that Lord Rayleigh while contributing to our present wave theory, also contributed some errors of interpretation. Music itself offers a wide field of applications to be derived from better understanding of Quantum Arithmetic.

The relationships of Quantum Arithmetic in motion help us to present proposed improvements in understanding wave theory as it applies to usage when separated from matter.

An understanding of harmonics of energy cycles explains many of the phenomena we have encountered, both synergistically and devastatingly. Had we had this information previously, many major accidents could have been prevented. Information gleaned from accidents could have been put to good use elsewhere.

When we, being composed of matter, consider that matter is of primary concern in the creation, we put ourselves somewhat in the position of "Flatlanders", unable to perceive the third dimension. Matter is not a primary parameter of the foundations of science. Matter is a secondary creation, secondary to the vibrations and cycles of energy.

As will be explained in future chapters, energy of vibration is divided into several stages of magnitude and perhaps the Biblical seven stages of creation. Each stage is one magnitude of energy

values, or of hertz, if you please. The production of matter falls in only one of those stages. Three other magnitudes have been located. The highest is that magnitude containing the octave of visible light. Another magnitude is of audible sound ranging from approximately 30 hertz to maximum of ten kilohertz. Below that is still another magnitude, which concerns us directly and is the magnitude of mentalism.

These three magnitudes are directly observable from our magnitude of created matter. It is possible to fathom them through our senses, but our senses are restricted, and limited to this range. There are other magnitudes above and below this range. Our knowledge of astronomy falls in the category of measurement of magnitudes by its periodic cycles.

So this provides a brief outline of what will be studied in this volume, and a warning of the difficulties the readers may expect. It will be up to you to judge what is reality and what is illusion. Reality means that something really exists whether we can sense it or not. Illusion means that something only appears to exist when in fact it has no place in creation. Lord Rayleigh believed the higher harmonics were created by an audible note. That was his illusion. The reality is that the lower note is created as the sum of the harmonics above it. Without them the note could not exist. That is the reality.

### TEST

1. In an ellipse,  $J=28$  and  $K=70$ . What is  $L$ ? If your answer is not 140 then go back to Book 1.
2. Same ellipse: How many quantum points are there in this ellipse? If your answer is not 84 then go back to Book 2.

If you answered both questions in less than one minute then congratulations.

If the answer required 5 minutes, you are satisfactory.

If you took more than 10 minutes, perhaps your arithmetic needs practice.

Synchronous Harmonics leads us in a direction to a better understanding of energy. The previous chapters of Quantum Arithmetic concerned the STATIC phase of numbers. This chapter enters, now, into the DYNAMIC phase of Quantum Arithmetic which is called "SYNCHRONOUS HARMONICS". This dynamic aspect takes the numbers, in their relationships, as they repeat them-

# Quantum Arithmetic

selves, in continuing sequence, as trains of waves. These waves of energy progress in step with each other.

As the mathematics of Quantum Arithmetic is placed into motion, through Synchronous Harmonics, drawings of various wavelengths in pairs and their composite, explain more about waves. The importance of the 4-way division of integers, becomes apparent, and we also begin to understand "wave packets" better.

## TIME SYNCHRONIZATION

Synchronous Harmonics is the dynamic relationship between numbers and number groups. Each number seems to start at one unit and repeatedly builds itself to their full value in a continuing process. Each number reaches its full value in due course and starts over. When two or more numbers are working together they seem to stay in step unit by unit like cogs on a wheel. One can imagine these number progressions are controlled by synchronized units of time.

Take the two simplest numbers, 2 and 3, to see how they progress. They both start at 1 and 1. At the next step they progress to 2 and 2. The "2" is completed and ready to start over. (See below). At the next step they are 1 and 3 which completes the "3", preparing the "3" to start over, leading to their values as 2 and 1 at the fourth time-jump. At the fifth time-jump they will be 1 and 2, and the sixth time jump they will be 2 and 3. At this point they again come into synchronization as they were, at the end of one cycle and the beginning of the next cycle.

These can be listed by their quantum time:

Time	"2"	"3"
0)	0	0
1)	1	1
2)	2-0	2
3)	1	3-0
4)	2-0	1
5)	1	2
6)	2-0	3-0

The "2" goes through cycles and the "3" goes through cycles.  $2 \times 3 = 6$ . All through their progression they have different (instantaneous), comparative value. At each step, they never repeat a relationship in values within a cycle so long as they are coprime.

## ENERGY IN MATTER

These must be considered as energy values which are completely divorced from matter. Matter represents a static relationship between number groups as time progresses. Energy progresses through this dynamic process within mathematics.

Matter is static in nature. It is theoretically composed of precise frequencies of energy to form a standing wave we call matter. Once formed, matter can absorb and release surplus quantities of certain frequencies. The physical characteristics of matter result from the alteration of energy content of that matter.

Matter can change in its heat content but heat is energy. The change is in the amount of energy bound up in the matter with no permanent change in the matter. Its absorbed energy, or temperature, is only a transient change. Heat energy can also cause matter to expand or shrink. It is this energy which is the subject of Synchronous Harmonics.

The study of energy has always been pursued by considering energy to be composed of waves. The values, as given above, could be the instantaneous value of each wave in relationship to the other. The "2" goes through three cycles while the "3" goes through two cycles. This is because 2 and 3 are PRIME to each other. They both coincide at their product 6.

From these examples we can guess that the correlation between 5 and 6 might be. They would coincide at 30 which is their product. From zero to thirty, they could form every combination of 0-5 and 0-6 without repeating any combination, until they culminate at 30:

Time	"5"	"6"
1	1	1
2	2	2
3	3	3
4	4	4
5	5-0	5
6	1	6-0
7	2	1
12	2	6-0
13	3	1
14	4	2
15	5-0	3
16	1	4
17	2	5
25	5-0	1

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26	1	2	of 4 x 6:
27	2	3	
28	3	4	
29	4	5	
30	5-0	0-0	

The "30" is considered the ending, or synchronous point, but it is not the harmonic point. The harmonic point will be described later.

Let us consider how 5 and 7 will correlate. The 5 must go through as many cycles of its value as the value of the other number, (7). The first number is 5, so it must go through its instantaneous values of

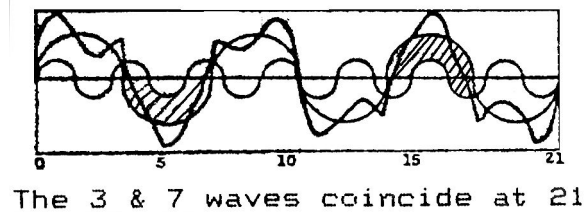
0, 1, 2, 3, 4, 5-0, 1, 2, 3... seven times.

The other number, 7, must go through 5 cycles of 0, 1, 2, 3, 4, 5, 6, 7-0, 1, 2, 3, 4,... . The 5 cycles of 7, and the 7 cycles of 5 will coincide, (synchronize), at 35 because  $5 \times 7 = 35$ . The table will look like this.

Time	"5"	"7"	///	Time	"5"	"7"
0	0	0		19	4	5
1	1	1		20	5-0	6
2	2	2		21	1	7-0
3	2	3		22	2	1
4	4	4		23	3	2
5	5-0	5		24	4	3
6	1	6		25	5-0	4
7	2	7-0		26	1	5
8	3	1		27	2	6
9	4	2		28	3	7-0
10	5-0	3		29	4	1
11	1	4		30	5-0	2
12	2	5		31	1	3
13	3	6		32	2	4
14	4	7-0		33	3	5
15	5-0	1		34	4	5
16	1	2		35	5-0	7-0
17	2	3		Product and Synchronize		
18	3	4				

Time  
First  
Seco  
nd

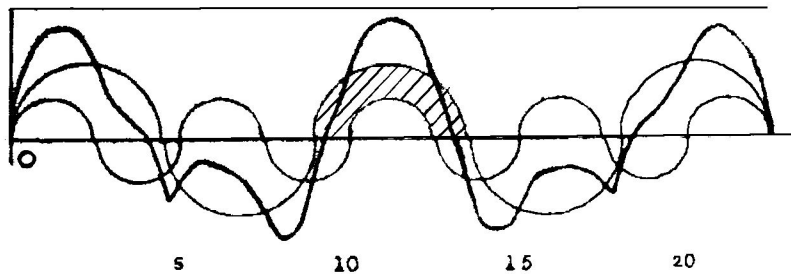
0  
0  
0  
1  
1  
1  
2  
2  
2  
3  
3  
3  
4  
4-0  
4  
5  
1  
5  
6  
2  
6-0  
7  
3  
1  
8  
4-0  
2  
9



They will coincide for the first time at 35 which is the product of 5 and 7. They will be shown later as sine waves.

### EVEN NUMBERS

What happens when two numbers chosen are 4 and 6 which are not prime to each other? The "4" is  $2^2$ , and the "6" is  $2 \times 3$ . Altogether there are three 2's in the factors, and only one 3. The results are given in the following table. The higher power of 2 will remain but the lower power will be absorbed in the higher power. Synchronization



1  
3

## Quantum Arithmetic

10	2	4
11	3	5
12	4-0	6-0

In this case they do not coincide at their product, ( $4 \times 6 = 24$ ), because they have the common factor of "2". They coincide at half of their product because they are not coprime. (They act as though the two numbers were "3" and "4"). At each step along the way the "4" and the "6" have different relative values without repeating that relative value. They proceed through only half of the expected combination of values.

### GRAPHICS

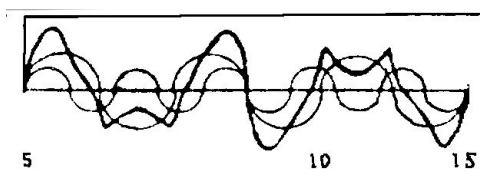
The waves of 3-units, 5-units, 7-units and of 9-units are shown in various combinations. The first two diagrams show waves of the same par value. The first graph, the pair of waves, (3 & 7) 9 are both 3-par. In the second graph, (5 & 9), are both 5-par.

The shaded areas at their  $1/4$  points, show the two points at which each pair of waves will coincide at their maximum values. The value of the wave, (that is height of the composite wave), is greatest at the one-quarter and the three-quarter point of the combined cycle. These are the HARMONIC points of each combination. When both waves of a pair are of the same par-value they will reinforce each other.

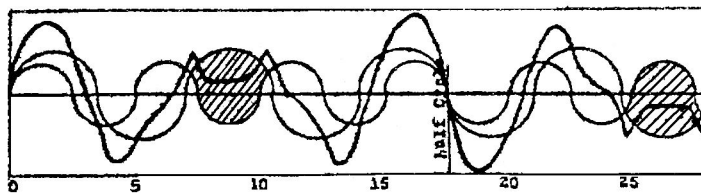
This is the mathematical equivalent of the type of "wave packet", in which two different waves will reinforce each other.

The 5 & 9 waves coincide at 45. Only the first half-wave is given. The second half is a mirror image of the first.

In the case of the 3-unit wave and the 7-unit wave they will HARMONIZE at  $1/4$  and  $3/4$  of their product. Since the product is 21 the surges will occur at 5 and  $1/4$  units, and at 15 and  $3/4$  units.



In the case of the 5-unit wave and the 9-unit wave, their product is  $5 \times 9 = 45$ , so the maximum point of the surge will occur at 11 and  $1/4$  units,



(as shown), and at 33 and  $3/4$  units.

Only the first half of the 5-units and 9-unit waves is shown. If the first quarter of this wave, as shown is rotated about the vertical axis at 11 and  $1/4$  units, it will complete the first symmetry. Then if all of this wave is folded at the vertical axis at 22 and  $1/2$  units and the last half rotated about the horizontal axis, it will complete the wave at 45 units. The last half of the wave is symmetrical to the first half. Also, each quarter of the wave is symmetrical with all other quarters. It is symmetrical in exactly the same way the reciprocal of 17 is symmetrical in problem No. 9 at the end of this chapter. The difference is that in problem No. 9 the work is STATIC, but here it is DYNAMIC.

When one wave is 3-par and the other is 5-par, the composite graph will be changed considerably.

The 3 and 5 waves will oppose each other at  $1/4$ , and at  $3/4$  of 15, because one is 3-par and the other is 5-par.

The 5-unit wave and 7-unit wave, will oppose each other at  $1/4$  and at  $3/4$  of their product, 35. At these points they will essentially cancel each other forming the second type of wave packet, which is sometimes called the "null wave packet". (Only the first half of this graph is shown. The other half is a reflection).

When two waves are of the same par type they will support each other at the quarter points. When they are of opposite par type they will oppose. The net result is that the composite of the first graph is much smoother. The second type tends to have more spikes and sharper points. This latter graph, of 3-par and 5-par waves, will also have flattened spots at the quarter points.

### EUCLID'S 4 NUMBER TYPES

This demonstration through Synchronous Harmonics, more clearly shows the reason for considering the division of integers into the four par types. These four par types are:

# Quantum Arithmetic

2-par, (even-odd,  $4n-2$ ); 3-par, (odd-even,  $4n-1$ ); 4-par, (even-even,  $4n$ ); and 5-par, (odd-odd,  $4n+1$ ), waves.

This is missing from contemporary mathematics. Contemporary mathematics acknowledged the  $4n+1$  and  $4n-1$  integers, but completely missed the full gravity of them. It also completely omitted the differentiation between 2-par and 4-par integers.

## WAVE PACKETS

The four-way division of integers, as Euclid named them, leads to the formation of Wave Packets. But only the 3-par and 5-par waves contribute, and they contribute only at the harmonic point of their composites. At quarter points of their product, when several 3-par waves, or wavelets, harmonize, they will form a greatly enhanced composite wave. Ovid. W. Eshbach, "*Handbook of Engineering Fundamentals*", John Wiley & Sons, (1952) defines wave packets: "- complex, yet, periodic wave forms can be obtained by an algebraic superposition of several waves of different parameters. The superposition of waves with infinitesimally different frequencies will, at a certain time,  $t$ , give an absolute maximum for a point  $x$ . They progress at any other instant to give a maximum, periodically.

Only the 3-par waves, or the 5-par waves will superimpose to enhance a wave packet, at their harmonic points. The 3-par and 5-par together, when equally balanced, will form a "null" packet. (This is demonstrated in the next chapter.)

The composite values of these various graphs demonstrate the part this 4-way division of integers play in creating the spiked wave packet and the null wave packet.

These will prove, eventually, to be very important to future wave theory developments, and will enable us to reach knowledge which has been unavailable to us because it is completely beyond our sensory capability. These will be followed up later in this chapter. This also demonstrates the reason Euclid claims there is a 4-way division of integers into even-even, even-odd, odd-even and odd-odd. It explains that which Sir Thomas Heath puzzled over in Book VII of Euclid.

## PHASING IN

Any odd-valued wave will automatically phase-in although this is not readily obvious. It makes no difference on which integer any odd valued

wave may begin. It will be in phase and eventually reach a synchronous point with all other odd valued waves. This occurs for exactly the same reason that the remainders of a division process, must go through all integers which are less than the divisor when prime numbers are involved. (See Problem 9, page 9.)

No odd-valued wave will approach the baseline from below at an integer. It is always at a half-integer. When two waves are not coprime, they will come into phase at their product, after common factors are removed. If any of the prime numbers also have higher powers, only the one highest power is retained, and lower powers are dropped. This reduces the factors to coprime status.

Contemporary mathematics is unconcerned with factoring wave values into prime factors. Indeed, this could not be done because quantum values are not used, and could not be known until now.

All waves with which we are familiar are composed of not more than eight prime factors. However, they may contain as few as four prime numbers for the male waves and possibly as few as three prime factors for female waves. The male wave, such as the one with a quantum number like 17, 32, 49, 81 will have only four prime numbers 17, 2, 7 & 3, or their powers. The female wave, such as 2, 7, 9, 16 will have only three prime factors, 2, 7, & 3. Other such waves will also exist if the difference, between two powers of 2, is equal to the sum of two prime numbers. These are rather unique sets, and it is thought they are quite rare. In the case of the female waves, they must begin with 2 because any other 2-par integer will include a second prime number. They may not begin with a 4-par number and end with a 2-par integer. Whatever the case, no male wave can have less than four prime numbers, and will most generally have seven factors.

On the other hand, the coming into phase is an essential part of all harmonics. If it were not for this automatic phasing-in, music would find it impossible to form a musical chord. Some of the following problems partially demonstrate this phasing in process.

What is it about Quantum Arithmetic that makes it so difficult to understand? There really are no new basic facts that were not known in conventional mathematics. What Quantum Arithmetic has done, is to take many of the trivialities which were known but were passed over in conventional mathematics. What is new is in showing

## Quantum Arithmetic

the relationships between these trivialities and showing how these relationships are all tied together and form the foundation of conventional mathematics. But the missing mathematical foundation of our sciences is only found in Quantum Arithmetic.

The mathematics of Quantum Arithmetic is so interlocking and so simplified that it becomes deceptive in the ends which can be reached. One is tempted to challenge its existence but one cannot challenge the mathematical proofs on which Quantum Arithmetic is founded.

Through Synchronous Harmonics we may be able to understand why Sympathetic Vibration occurs. On this approach through static Quantum Arithmetic and its dynamic stage, Synchronous Harmonics, we are better able to see the immense system which the prime numbers give us for understanding science and nature. Quantum Arithmetic is not Number Theory, but it does extend our understanding of the number system.

Harmonics, alone, have created numerous problems in present technology. A better understanding of harmonics, and the true parameters which must be considered, can help prevent those accidents.

It is a long road. First we must be able to pinpoint the true parameters in any construction, or creation. Then we must be able to Quantize those parameters into terms acceptable to Quantum Arithmetic. In this way we can determine the helpful, and the harmful, harmonics which are intrinsic in any proposed construction. We can be able to determine the true harmonic analysis in any design, and the probable harmonic stresses which that construction must withstand. This applies to earthquake hazard as well as all other energies which our designs must resist or use.

What has been discussed in this chapter concerned only waves in pairs. A previous paragraph above stated, in effect, that no wave exists which has only two prime factors. There is only one exception, and that is the first, based upon the quantum number 1, 1, 2, 3, which has less than three prime factors. It has only the prime factors of 2 & 3. This generates the "unity" prime right triangle -- the 4, 3, 5, basic triangle which will divide into every larger triangle, and represents the "IOTA" which will be introduced much later.

The following chapter will begin to discuss the empirical waves which we will encounter which have from three to seven prime factors.

### PROBLEMS AND QUESTIONS:

1. Sketch waves for the correlation between a period of 5 units and a period of 11 units.

(Use half circles for simplicity.)

2. Sketch waves for the correlation between a period of 7 units and 11 units. Start them at any unit on the graph paper. Where they synchronize will automatically be 77 or zero, as they phase in.

3. Sketch waves for the correlation between a period of 5 units and 8 units.

4. A bicycle has 37 teeth on the pedal sprocket and 13 teeth on the rear wheel. How many times must the pedal sprocket turn to again be in the same relation to each other?

Ans: 13

5. In the above problem, how many revolutions has the wheel made:

Ans: 37

6. Both sprockets have circulated the same number of teeth in this cycle. How many teeth passed a given point on each before the gears return to the original relationship?

Ans:  $13 \times 37 = 481$  teeth.

7. If the bicycle chain had 104 links, How many links must pass before a given tooth on the pedal sprocket re-engaged any given link a second time?

Ans: 3848. (because 13 and 104 are not coprime and  $37 \times 104 = 3848$ )

8. In the above question, how many links must pass a given point before a given tooth on the rear wheel sprocket re-engages a given link for the second time?

Ans: 104 (Because  $13 \times 8 = 104$ ). Any given tooth on the rear sprocket would engage only eight different links. It would never engage the other 96 links.

9. With pencil and paper, divide 17 into 23 until it repeats. List each digit of the quotient and below it list the remainder for the next division.

Ans: The division must go through

## Quantum Arithmetic

every remainder less than 17 before it will repeat --  $3 \times 4 \times 5 = 60$  unit cycle.  
because both numbers are prime. The division will give:

$1/6, (3/9, 5/5,$   
 $2/16, 9/7, 4/2,$   
 $1/3, 1/13, 7/11)$   
 $(6/8, 4/12, 7/1,$   
 $0/10, 5/15,$   
 $8/14, 8/4, 2/14),$   
 $(\text{repeat}), 3/9,$   
 $5/5$

10. Divide 37 into 104 as in problem #7. It should go through 36 remainders since 37 is a prime number, but it does not. It repeats after three digits. Why? This occurs because 37 divides evenly into 999, and the primes, 2 & 5 enter the picture through the decimal system.

### MULTIPLE WAVES

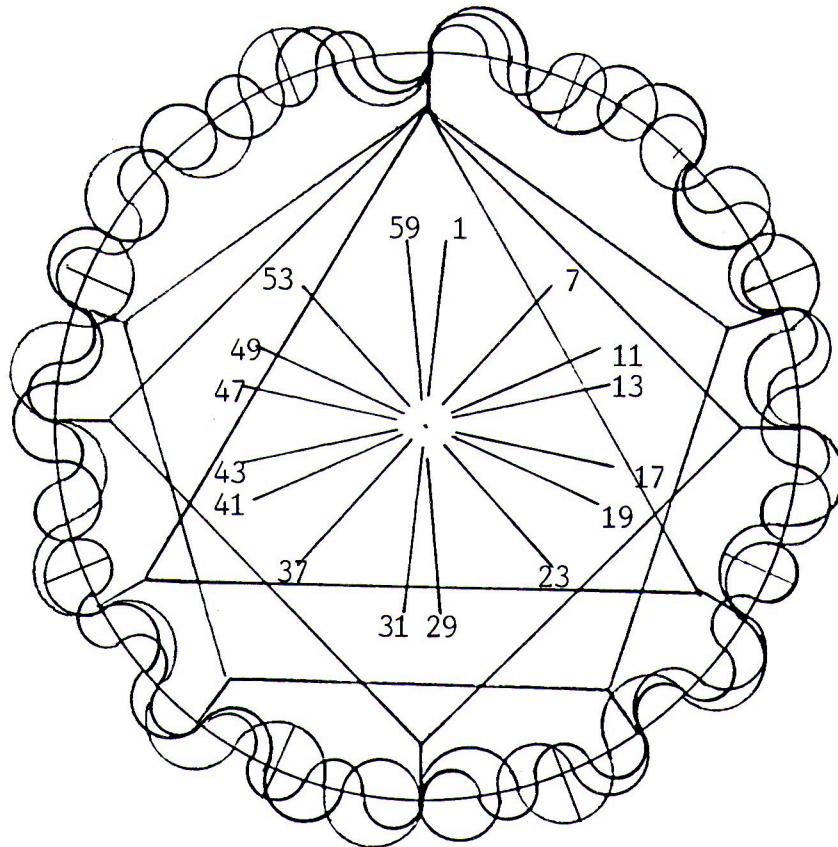
With the simple combinations behind us, this chapter will look into what is beyond. It appears that no wave can be formed with less than four prime, or coprime, integers. There must be the 2, 3, 5 and/or 7 along with one larger prime number. Go back to the two waves plotted on a single straight line. Instead of a straight line, let us plot them on a line that closes on itself in a circular or elliptical line. This closed line will represent the straight line used previously.

### THE HARMONIC CYCLE

A drawing of the plotting of a 3, a 4, and a 5-unit cycle on the circular line is given. In this case, the closed circular line is 60 units in circumference. This can be considered as one "Harmonic Cycle" which is being theorized. In this case the larger circle closes at 60 units. The three plotted cycles, 3, 4, and 5 also close at the same point

The phase relationship between the 3, 4, and 5 waves repeat themselves only at

60 units. But the 3 and 4 repeat their phasing, 5 times, (at 12, 24, 36, 48, & 60); The 3 and 5 repeat their phasing 4 times, (at 15, 30, 45, & 60); And the 4 and 5 repeat their phase cycles 3 times, (at 20, 40 & 60).



Connecting these in-phase, (Synchronous), points for each pair will inscribe a pentagon, a square, and an equilateral triangle respectively. These happen to be the three plane shapes which compose the five different Platonic solids. The application of this configuration will be discussed in a later chapter in connection with the first creative "Myriad"; And in connection with the formation of "standing waves". This formation is one of the features which can promote the "waterfalls", which are also discussed in a later chapter.

The 60-unit harmonic cycle is only one of several types. These begin with the circumference of the larger cycle being 30-units, 42 units or 105 units, and powers of 2, 3, 5 & 7 as multiples. The 30-unit cycle is composed of 2, 3 & 5 waves. The 42-unit cycle is composed of 29, 39 & 7 and the 105 unit cycle is composed of 2, 3, 5 & 7 unit cycles. The larger cycle on which the smaller ones are plotted can be any integer value. The larger, baseline circle, probably can be any value



## Quantum Arithmetic

larger than 10 units in circumference so long as that larger value does not have a 2, 3, 5 or 7 as one of its factors.

The circular baseline is intersected at all odd integers except 1 and the prime numbers from 7 through 59. These prime numbers are shown by the rayed center showing the symmetry of the twin primes, 11-13, 17-19, 29-31, 41-43, 47-49. Add to this the 59-61. The "3" and 5 are not rayed because they are used in the cycles. So, neither are their supplements 57 & 55. The 61 is in the next turn of the 60-unit cycle. These become symmetrical in 1-59, 7-53, 11-49, 13-47, 17-43, 19-41, 23-37 & 29-30, the total of each pair being 60. Some of these project to the circular baseline to points at which the 3-wave and the 5-wave oppose each other.

NOTE that 49 is shown as a prime number. That is because it is a power of a single prime number, (7), and that is its only factor. Any power of a prime number is also considered as prime, and will cancel any lower power of that prime root.

Since many quantum numbers contain the prime numbers 2, 3 and 5, this cycle is a part of every conceivable wave.

### OTHER CYCLES

What happens if the larger circle were, say, 61 units in circumference? Now the 3, 4, and 5-unit cycles would be one unit short of closing. In this case, we would have to show the larger cycle as a helix instead of a closed circle. Going around the helix again they would be 2 units short of closing. They would have to go around this 61-unit cycle 60 times in order to close at the same time the 61-unit cycle closes. One can begin to see the analogy between this and "the two gears and the chain" in the previous bicycle problem.

The helix would eventually close on itself at 3660 units. Because it closes on itself it is possible that the figure would more resemble a lissajou figure, (to be discussed later), rather than a true helix. Every harmonic cycle must contain a 2, 3 and a 5 and/or a 7 (or some power of them). One harmonic cycle, as described, must be a part of any wave that combines with another in a harmonious way. The composite wave of these low prime numbers constitute the "teeth" which must mesh with another cycle.

### PHASING IN (again)

But now suppose that just one of the several waves which compose a harmonic cycle begins out

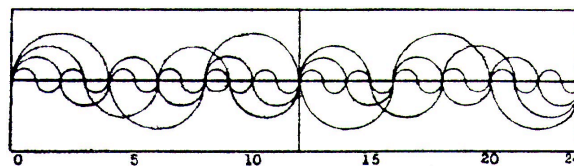
of phase, or begins on an integer other than zero. This appears to be a situation which would be impossible to manage, but it is not. As described in the previous chapter, there are no two, odd-valued cycles, which will approach the base line from opposite sides at the same point. That is to say, no odd valued cycle will be at full cycle when another odd valued cycle is at half cycle.

If cycles are plotted on Harmonic Cycle, starting at any integer, they would have the effect of simply rotating the zero point on that cycle. Problem #2 of the previous chapter helps to understand why any odd-valued cycle will phase in, regardless of which integer it begins its cycle. Each odd prime wave must necessarily pass through every possible remainder which is less than itself, a determined in the previous chapter. When in conjunction with another odd, prime-value cycle, the synchronization of these, (their product), will eventually coincide with every remainder of any third cycle.

There is one more condition which prevents any two cycle from approaching the baseline from opposite sides. To approach the baseline, an odd cycle must meet the baseline at a half integer on its half-cycle, as it approaches from the upper side.

To approach the baseline from the lower side the odd-value cycle must be completed and it will strike an integer. That is why two odd cycles can never approach the baseline on opposite sides, at the same point, thereby cancelling each other.

Surely, this sounds very trivial, but it eventu-



ally has high impact on the outcome of our developing wave theory.

### EXCEPTION

The above is not true, in the case of the even-valued cycles. A 4-par cycle will always approach the baseline from either side, at an even number. The 2 par cycles will approach the baseline from below at an even integer at the completion of it cycle. But it will approach the baseline from above

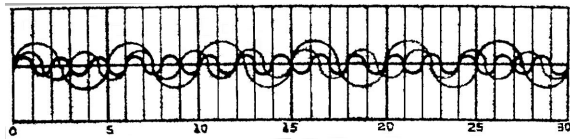
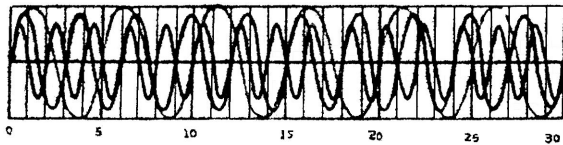


## Quantum Arithmetic

at an odd integer, at its half-value. At this half cycle it can oppose an odd cycle. It is a reason to call the 2-par number "even-odd".

There can be only one, 2 or power of 2, factor in any quantum number. The 2-par waves are the 2, 6, 10, 14, 18, 22, 26 etc. values. Since there must be a 2, 3, 5 and/or 7 in every harmonic wave, the 2-par values below 21, cannot be in any wave where the 2-par value exists with its odd prime factor being 2, 3, 5 or 7. So, the 22-unit cycle,  $2 \times 11$ , is the first such wave that needs to be considered. It will be considered, only when the 11-unit wave, or any 2-par or 4-par wave factor is not present in a quantum number.

Such a 22-unit wave will eventually meet (syn-



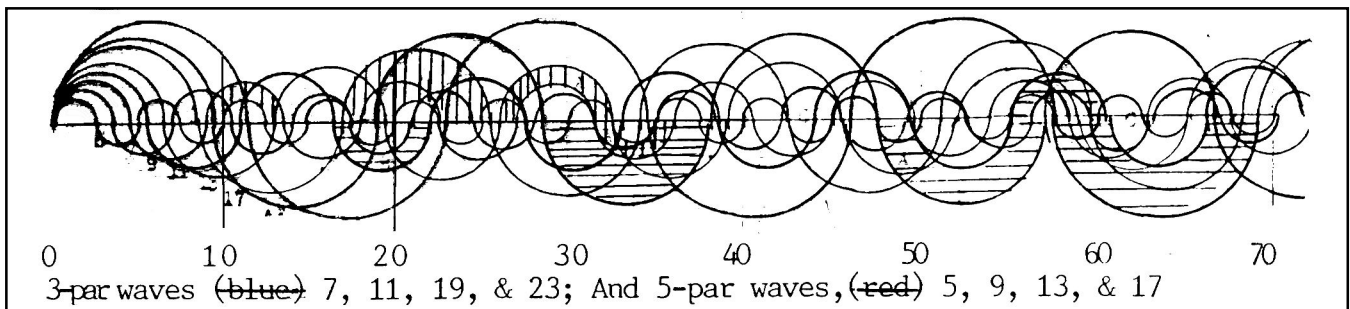
chronize with) every other prime-valued wave from the opposing side. It essentially absorbs and can-

The classical yin and yang makes its appearance here.

It appears between the 2-unit and 4-unit cycles and between the 4-unit and 8-unit cycles. The 6-unit cycle produces a distorted yin and yang in combination with the 2-unit cycle. The braided appearance comes from the reversal points where waves meet from opposite sides of the baseline. What application, if any, it may have, is unknown at this time. It does apply to the male - female division. In this division, the male has the outgoing, radiative characteristic, and the female has the attracting, absorbing characteristic. It is only part of the reason that most 2-par integers are considered to have the female characteristic.

### MOST BASIC MULTIPLE CYCLE

The following diagrams show the combination of 2, 3, and 5-unit harmonic cycle plotted on a straight baseline. The first is shown in sinusoidal form and in the second the waves are shown as half-circles. These drawings would be bent to join the two ends, in order to form the most basic harmonic cycle. In this particular case the drawing would be 30 units in length. In most physical cases, the harmonic cycle will be covered up in waves which are more complex than these as shown below.



cels a part of the prime valued wave at those points. It is for this reason of absorption, that the 2-par numbers are considered the female, or attracting and absorbing numbers. There can, and must, be only one 2-par, or 4-par valued cycle among any of those which serves as a baseline, or harmonic cycle.

A drawing of even-valued waves is shown. This composite includes the 2, 4, 6 & 8-unit cycles. They present a braided appearance in contrast to a combination of the odd valued waves.

### COMPLEX CYCLES

Most physically applied cycles are far more complex than those described above. The usual wave of nature will have seven prime factors or be made of seven prime waves.

This diagram, is not that of an harmonic cycle because it does not contain a 2 factor. It shows the cycles of the eight prime numbers from 5 through 23, including "9".

# Quantum Arithmetic

## SYNCHRONOUS POINTS

The graph is shown along 70 units of base line. The complete graph would be more than 300 million units in length. The only synchronous points, up to 70, are at 35 & 70, for  $5 \times 7$ ; at 45,  $(5 \times 9)$ ; at 55,  $(5 \times 11)$ ; at 63  $(7 \times 9)$ ; and at 65  $(5 \times 13)$ .

## HARMONIC POINTS

There are numerous harmonic points which are shown as the shaded areas, at quarter points of products. Of particular note is the area below the line near 33 units. The 5 and 9 are concentric around 33.75, and the 7 and 19 are concentric around 33.25. The first two are 5-par and the 7 and 19 are both 3-par. This is as close as they could possibly be for 3-par wavelet and 5-par wavelet to support each other.

## WAVE PACKETS

From about 40 to 50 there will be a flat area in the composite graph, because of the cancellations. This will create a null wave packet. From about 22 to 28 will be an enhanced, (spiked) wave packet in the composite graph because most of the waves are above the line.

It would be difficult to perform a wave analysis, of waves which are this complex through conventional methods. With Quantum Arithmetic the precision of the analysis stands out. One must first start with proper parameters for analysis. Quantum Arithmetic does give the precise values to be used for designing a wave.

It will be many years before anyone will use waves of this complexity. Each wave must have a 2, 3, and 5 and/or 7. (This drawing has no even valued wave for "2", but it does have a "9" representing the "3". It serves only as a demonstration. It does put us in a position for improving on our wave theory and theory of energy. The following chapters will work toward that end.

## ALIQOT PARTS

What is an aliquot part? An aliquot part is always a composite number. It is usually the product of four to six prime numbers which derive from a quantum number.

A quantum number consists of four integers in Fibonacci configuration. These four integers are coprime, but not necessarily being all prime numbers. Usually one of them is prime and the other three quantum integers are products of two or

more prime numbers each. There are but eight quantum numbers which contain only the prime numbers of "7" or less. (See Problem 8 on Page 9, Book 1.) All other quantum numbers have prime numbers larger than 7 and usually have 5 or more prime numbers within them. There are very few quantum numbers which will have eight prime numbers represented. If there are more than seven prime factors to a quantum number it usually means it is misquantized. So we can safely say that each wave derived from a quantum number will have 5, 6 or 7 prime numbers.

An aliquot part of such a wave will be the product of all prime numbers, excepting one of them, in its quantum number. When two different wavelengths have a series of the same prime factors, the product of those prime numbers forms an aliquot part of each wavelength. These aliquot parts will be identical in the two waves except for the carrier wave of the one prime number which is unique to each wave. The full cycle of each aliquot part may be as pictured on page 12. The difference would be that most aliquot parts of a waves are composed of five prime internal cycles, rather than the three as pictured. They will be much more complex than these two prime wave cycles.

## EXAMPLE

The aliquot parts of two waves, X & Y, are  $2 \times 3 \times 5 \times 13 \times 47$  units. These are the prime numbers which are common to both waves. But wave X has 53, of these quantum units in its quantum number. Wave Y has 7 aliquot parts in its prime number. After wave X goes through its wave 7 times it will be equal to wave Y going through its cycle 53 times. The aliquot part acts as a single unit in each case. The aliquot parts between these two waves may be visualized as acting as gears on two different cog wheels. Each tooth would represent an aliquot part. These teeth would mesh perfectly between the two gears. It represents the bonding between two elements or bonding between two musical tones.

Either one of these waves can be divided into aliquot parts in different ways by leaving out a different prime factor. It could then bond to still a third element or tone which had this new aliquot part.

## QUESTIONS:

1. How many ways could aliquot parts form in a wave with the quantum number 10, 11, 219 & 33?

## Quantum Arithmetic

Ans. The factors are 2, 3, 5, 7, 11 & 32. The 32 supersedes the 2 so the factors are 32, 3, 59, 7 & 11. Leaving out one prime factor each time there should be five different ways. However the product which leaves out the 32 and the factors which leave out the 3 factor will be invalid because every aliquot part must contain the factors 2, 3 and a 5 and/or a 7. The aliquot parts are: (1)  $3 \times 5 \times 7 \times 32 = 3360$ ; (2)  $3 \times 5 \times 11 \times 32 = 5280$ ; & (3)  $3 \times 7 \times 11 \times 32 = 7392$ . The invalid ones are:  $3 \times 5 \times 7 \times 11 = 1155$ , &  $5 \times 7 \times 11 \times 32 = 12320$ .

2. The product of  $2 \times 3 \times 5 = 30$ . List the primes to 30 leaving out the 2, 3 & 5. Below these list the primes from 30 back to 1.

Ans: 1, 7, 11, 13, 17, 19, 23, 29.

29, 23, 19, 17, 13, 11, 7, 1.

Note the symmetry, and the sum of each pair being 30. Notice also that  $5^2 + 5 = 30$ ; That  $3^3 + 3 = 30$ ; And that  $2^5 - 2 = 30$ . This is a part of the configuration of prime numbers.

3. Do the products of other sets of prime numbers also make up this type of configuration?

Ans: Yes! there are a few. One was  $3 \times 4 \times 5$  in the Harmonic Cycle which was pictured and there are others. Find some others. As the products become larger certain anomalies begin to occur. One of the factors must always be a 6 or multiple of 6.

## HARMONICS

Harmonics is one of the more important developments of Quantum Arithmetic. It is quite different from the harmonics we are familiar with. From the background of the geometry of numbers, presented in Books 1 & 2, and more particularly the understanding of Synchronous Harmonics, the meaning and impact of HARMONICS takes its place in future development in science and technology. With HARMONICS, music enters the field as an exact science which can function with our technology.

Up to this time science has had to operate on the theories proposed by Lord Rayleigh. Despite his extensive and complicated mathematical derivations, there are gross errors in current theories, because of errors of interpretations within that now outdated mathematics.

That a note produces all higher harmonics was obvious to our senses and in conventional

mathematics BUT it was NOT true. It is only an illusion. Quantum Arithmetic, and particularly Synchronous Harmonics gives us an idea of how harmonics works. Those higher harmonics of the lower note are there BEFORE the lower note is produced. The higher harmonics working together create the lower note. The lower note does not create the higher harmonics. And that completely turns the tables on harmonics technologies.

The higher harmonics creating lower energy frequencies is what creates entropy. The travel of energy from higher frequencies to lower frequencies is irreversible. We can, however, derive the higher harmonic by cutting into the string of propagation and bleed off this higher frequency before it fully creates the lower harmonic. This does not negate entropy. It is always done at a cost and results in a severe loss of mechanical efficiency.

Harmonics relates to the relationship between two or more different frequencies. Finding the harmonics between two frequencies, they must first be quantized individually, to determine their quantum numbers and then together to determine their quantum relationship. The next step is to factor each set of four integers into their prime factors and powers of any prime numbers.

The reason they must be quantized is that values in conventional units of measure cannot be factored satisfactorily. For instance a note of 440 A, will factor into 8, 5 and 11 ( $8 \times 5 \times 11 = 440$ ). The frequency for C at 263.2 will harmonize with it. Its prime numbers are 8, 7 and 47, ( $8 \times 7 \times 47 / 10 = 263.2$ ). But it is an absolute requirement that every number have 2 and 3 as factors. They should not harmonize under conventional mathematical evaluation by factoring but hearing these two notes in a chord we know they WILL harmonize.

So we must quantize those two notes together and come out with numbers in their quantum relationship. Their values should be shown in the ratio of 329:550 instead of 263.2:440. But this is not the 3:5 ratio (which will be discussed below). The factors of 329 are 7 & 47. The factors of 550 are 2, 25 & 11. But quantizing between them (sum and difference) they have the factors of 2, 3, 7, 13, 17 & 47 indicating some harmony between them. That is the harmony we sense. They are in the ratio of 1:1.6717325.

In the 3:5 ratio, (1:1.666667), they should be frequencies of 264:440 instead of 263.2:440 with superb harmony. The notes we use have the factors of 3 & 47 for one and 2, 5 &

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11 for the other, which indicates a makeshift harmony but not the perfect harmony which could be achieved. It is common practice to tune a piano slightly off from the ideal harmony in order to stretch or shrink the scale in order to make perfect octaves.

Octaves in music as a science, are not perfect octaves, but they will produce perfect music, in the frequencies and harmonies of nature. We have developed the Pythagorean scale, the Just scale, the Equal Tempered scale, the Chromatic scale, and so many more, because of our attempts to look at music in an octave-by-octave approach. This is where we leave music as an art, to make it music as a science.

The perfect harmonies in music as a science carry over into other areas. The most apparent area is in the harmonies of colors of visible light. From here it carries over into the harmony between certain of the various energy states of atoms of the elements. This brings us into the harmony between types of matter, and music of the stars, and planets. It also carries us into harmonies completely divorced from matter.

## THE MATHEMATICS

In looking at frequencies from a mathematical view, it is found that the quantum aspects show harmony at frequencies having prime factors of 2, 3 and 5 and/or 7 along with two to four other higher prime numbers. Such a frequency will harmonize with any other frequency which also has the same factors plus one unique higher prime factor. None of these higher prime numbers may be greater than 100. This requirement applies not only to music, but to any other range such as visible light and atomic energy states.

But the reader may ask, "How can we calculate sound frequencies in the same range of frequencies, as light, or as heat, or astronomy? It is because we are discussing quantum frequencies, measured in quantum units of measure. For any waves with which we are concerned, the wavelength is the product of all prime numbers of which it is composed. The wavelength is the product of the four integers of its quantum number.

That is only the beginning of the answer. The rest will come in later chapters. But to look ahead briefly, nature limits its number system to the range of zero to ten thousand, just as the Greeks once determined. It is thought they actually limited it to 5040, because  $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$ . But  $7 \times 8 \times 9 \times 10 = 5040$  also. That is one of the reasons Pythagoras claimed that the working numbers

stopped at 10.

Nature has "jumps" in scale, just as we do in measuring distances in meters. When the meters become too great we revert to kilometers. Then we adopt even greater unit distances when kilometers become too many. Nature does this also. It is suspected it adopts the multiple of 5040 but the value of 10,000 will be adopted here.

When there is a jump in quantum measurements, the original mathematical laws are also recycled to the new scale and will apply just as they did before. It is then possible to extrapolate from the range of sound to the range of visible light and to other ranges. This applies to harmonics in all ranges, as will be discussed in later chapters. The chapter on Music and the chapter on Chemistry will describe specific extrapolations.

## INTERDEPENDENCE

There is an interdependence between Synchronous Harmonics and simple Harmonics. In saying above, that harmony depends on similar sets of prime numbers in different waves. The product of these like prime numbers is what is referred to as an "aliquot part". For harmony, the aliquot part must have primes of 2, 3 and 5 and/or 7.

## WAVE PACKETS

Studying the 3-par cycles opposing the 5-par cycles explains the ultimate cause of the peaked wave packets and the null packets. They always occur at harmonic points between two or more waves. These waves, 3-par and 5-par wavelengths, will tell us how prime numbers work together. The cause goes back to the definition of the 4-way division of integers, and particularly the 3-par and 5-par cycles. The 3-par and 5-par cycles concern the male/female division of numbers, which in this case are normally defined as right and left polarities.

## PHASING (again)

Understanding why any given cycle can begin at any unit on the graph, is important to harmonics. Starting a cycle at any unit causes a new LAW of harmonics to be invoked. This causes the whole graph to change to a new synchronous point, with its new harmonic points of the remaining cycles. This helps us understand how nature works in very small quantum parameters. Considering this through logic we can then see how any musical note can always harmonize

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with another in the same way. If it were otherwise, nature could not operate. It also tends to emphasize that there has to be a quantum unit of time to accomplish this feature.

### EXAMPLES

There are physical examples of harmonics, two of which come to mind from a century ago:

### PHYSICAL HARMONICS

In the 1800's, majestic pipe organs were made which produced sounds down to 16 hertz, (vibrations per second.) To produce such a low sound would require a pipe more than sixty feet in length. The makers of the organs found they could produce these low sounds with two small, peanut-sized pipes. These two small pipes would cascade their ultrasound to longer audible tones. They each produced sounds which were too high to be audible, but together they produced those notes as low as 16 hertz. This will be referred to as a "Cascade". The tuning of such pipes was a trial and error business. The high pitch produced the lower tone and not the reverse as claimed by Rayleigh. We can now mathematically design ultrasounds which will cascade to a precise lower frequency.

Recently these ultra-sounds were produced electronically with known wavelengths. They will produce any tone in the audible range and higher. In order to do this the two inaudible tones must be in a ratio of a low fraction, (halves to sevenths) to each other. Of course, if the second tone is  $\frac{8}{7}$  of the first, then the first must be  $\frac{7}{8}$  of the second. This may help us to understand harmonics a little better. This fractional ratio can be carried to 11ths and 13ths, but the harmony between them decreases substantially.

A second case occurred in 1873-74 when John Tyndall was testing sounds for foghorn use along the English Coast. He found that low sounds usually projected much farther than high pitched sounds. But there were unexplained periods when the high pitched sounds would travel 18 miles while low pitched sounds could barely be heard at 3 miles. That is the primary reason that fog horns at many light houses sounded two tones. This paradox is still unexplained but it has been confirmed. [John Tyndall, "The Science of Sound", Citadel Press (1964)].

Certain machines will produce high pitched sounds and low pitched sounds but do not produce many pitches in between. One of these machines is a jet engine. It was found, in listening to

planes flying overhead, that high pitched sounds could not ordinarily be heard. But there were short periods of ten minutes to several hours when the high pitched sounds were more perceptible, and the low pitched sounds were negligible, still, no explanation has been found.

A more recent case of catastrophic harmonics was in the collapse of the Puget Sound Tacoma Narrows Suspension Bridge, 50 years ago. Harmonics was the cause, but the science of harmonic is not sufficiently known to prevent such a thing from happening again. All that can be said, for sure, is that the wind velocity was feeding high pitched energy into this bridge, at cascading harmonic wavelengths which the structure would accept until it was more than this bridge was designed to withstand.

It is exactly the same case which requires a column of marchers to break step while marching across a bridge. In both cases there is a cascading of energy which is made possible by the "Quantum Flexibility" discussed later. In the case of the bridge, several 5-ton weights placed at prime intervals along the bridge, to break the harmonics, could have avoided this failure.

Another case where harmonics are concerned, is in our system of electrical distribution. Certain limited cases have been diagnosed and avoided. But there are still major problems which can create havoc. Such a case occurred in the major blackout of New York state, in the 1960's. This was quite possibly a problem in not understanding harmonics.

It is difficult to describe how Harmonics works because it is continually moving. It is dynamic. It is like trying to describe all of the waves of the Sun's rays, interacting with each other, and continually changing.

### THEORY

In working toward a more proper derivation of a workable wave theory, certain experimentation was required. Some of the examples will be given, along with an improved conclusion on theories.

Up to this point, wave theory will read:

*"Energy can be approached from the aspect of frequency or the aspect of wavelength. One is the inverse of the other. Each vibration of energy is divided into aliquot parts, through the smaller prime numbers. The aliquot parts divides the categories of waves into classes which*

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*are harmonic, one with another, in a quantum way."*

In order to understand energy, one must work with the individual wave in a train of waves. It can be done through frequency or through wavelength. One is the inverse of the other. Each type of wave is unique. It gains its uniqueness through one prime number which is unique to that wave. Since there are generally up to seven prime numbers contributing to each wave, the other six will contribute to the aliquot part of that wave. That aliquot part is usually larger in value than the unique prime number. The aliquot part is equal to the product of these six. In the complete wave, it is repeated the number of times indicated by the unique prime number. (See Harmonic Cycle).

### VARIOUS MYRIADS OF HARMONY

Harmony involves two waves which have the same aliquot part. When two or more waves have the same aliquot parts, these aliquot parts will act in the same way that two or more gears will mesh by having teeth at the same pitch. The diameter of each gear will represent the unique prime number of a wave. Such gears will depict a mechanical harmony.

In music, one's ears can be trained to discriminate tone and harmony between tones. In color, one can also be trained to discriminate in harmony of color. But relying on the senses can often be misleading, partly because different people discriminate in different ways, which is apparent in tone deafness, and in color blindness.

In chemistry, harmony appears to play a great part in chemical combinations. The harmony appears to be between the electrons in harmonic energy states. That is the reason that most chemical reactions require rather specific temperatures to place electrons in those specific energy bands which are harmonic.

Harmony appears to play a large part in matters of health. This harmony has more to do with maintaining the standing wave patterns which maintain the body in workable and harmonious condition. More will be written on this.

In astronomy, the harmony is well recognized between the planets in our Solar system. This appears to carry one myriad upward into harmony between stars in a galaxy. Then it carries upward still further, by a myriad, to a harmony and balance between galaxies.

In mathematics, the harmony is demonstrat-

ed, in a different way, between the different geometric shapes. But between differently proportioned shapes of the same figure, direct harmony can be traced through each separate Koenig series, and each series of quantum numbers. The Fibonacci series is only one of the quantum number series.

Each of the myriads can contribute some knowledge of energy and harmony, but music and chemistry show the greatest promise.

### THEORY OF HARMONY

The theory of harmony is: *"Harmonies, or harmony occurs between two dissimilar cycles of energy, when both can be divided into similar aliquot parts having the same magnitude but different multitudes."*

Each of the dissimilar cycles is identified by its one unique prime factor which is not a factor within the aliquot part. Each unique prime is used as a multiplier of the aliquot part, in relation to the other cycle. The two cycles will produce a new wave equal to the product of their two unique prime factors.

In ordinary music, this longer wave will ordinarily be above the threshold of hearing, in the myriad below audible sound, (referred to later as the "mental myriad"). This appears to be one of the reasons that music can have an emotional content. It also plays a prominent part in many of the ancient legends involving music, such as the harp of Hermes; the pipes of Pan; the conch shells of Aruna, in the Mahabharata; and even the trumpets which crumbled the walls of Jericho. These are all examples of harmony and discord.

### THEORY OF ENERGY FORMS

Energy, itself, still is not defined. However, some of the mechanics of energy can be theorized, after the energy is created by the "forces". The theory is as follows: *"Newly formed energy is created in cycles, called Iota, assumed to be at about four quadrillion hertz. All cycles are equal but will aggregate in various magnitudes of "Harmonic Cycles". These shorter magnitudes of Harmonic Cycles will aggregate in groups of three to seven to form, (cascade), into a longer wave to be measured in a larger units, in continuing progression.*

This opposes the contention of Lord Rayleigh that waves propagate to increasing frequency. The smaller waves appear to aggregate

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in groups of five to seven to produce longer waves which are between 5,000 to 10,000 times the length of the aggregating waves. These longer waves are then measured in the original lower prime numbers.

How or where the cascading occurs is largely undetermined. The cause seems to be "Quantum Flexibility" which is discussed elsewhere.

Any given longer wavelength is composed of the original shorter wave length which becomes an aliquot part. This aliquot part is multiplied by a prime number greater than 7, to create the longer wave. A major part of any aliquot part is its particular harmonic cycle. The parts of the larger wave are this harmonic cycle within the aliquot part, and its unique prime number multiplier.

Energy filters downward instead of upward, and this is the essence of entropy. When the aliquot parts of two different cycles are similar to the extent that they are in low fractional ratio in their multitudes, they may cascade downward several octaves or even one or more myriads. It is thought there are seven useable octaves in a myriad, but there may be as many as twelve octaves. Instability occurs in the higher octaves.

NOTE: "myriad" and "iota" will be described in later chapters.

### EXPERIMENTATION

The preceding remarks, and theories are based on experiments which will be described. These experiments are based on judgemental physical results, and more-so, on non-judgemental use of the mathematical features of Quantum Arithmetic as described heretofore. A few of these experiments will be described for others to replicate.

The judgemental part, which are based upon sensory impressions in each case, which may differ from person to person. The non-judgemental part of the results derives from application of the proven principles of Quantum Arithmetic.

### HARMONY

Most experiments involved the use of the Commodore-64 computer to produce specific musical frequencies and waveforms. The choice of this computer is made because it has the SID, (Sound Interface Device), chip which permits producing frequencies or wavelengths digitally, without resorting to the analog slicing of a sine wave. Wavelengths were carried as near as possible, to a millionth of one hertz, (9 significant digits).

Several experiments were performed to determine the numerical content of notes which were in good harmony.

One such experiment entered a single note in a music program of my own derivation. This note was produced at a constant tone. Then a second note was introduced at a shorter wavelength, which was run through a (one millionth hertz) incremental loop to increase its wavelength in very small increments until it became 50% longer wavelength than the original constant note.

These 2-note chords progressed through "difference" beat-tones, until they died out at harmony. Passing through harmony, they began the "summation" beat tones and then disharmony. There were certain values of the incremental note which produced excellent harmonic response, with the constant tone. The program was modified to show the decimal ratio between the two notes on the video screen. The best harmonic response occurred at the low fractional ratios between the two notes.

Unexpected accidents occurred in that the sound, at a reasonable volume, produced harmonics which destroyed the electronics in the video monitor. After the third attempt, and the third video monitor I had the speaker disconnected and used a remote speaker.

Because harmonics seemed to dictate the lower prime numbers, (2, 3, 5 & 7), I designed the stable tone to a product of those low prime numbers but did not revise the variable tone. Then knowing the prime factors of the steady tone, I added a subroutine to the program, which would factor any variable tone at the point of my selection, and send them to the printer. Selecting both harmonic and discord pairs of notes, I found the discord notes were often very high prime numbers, and often only a single prime number. Those variable tones which produced the best harmony, invariably factored into a 2, a 3, a 5 and/or a 7, or their powers, and one to four higher prime numbers. The lower the largest prime number in the factors, the more harmonious was the 2-note chord judged to be. I thus concluded that the lowest prime numbers produced the best harmonic chords.

### CATTLE PROBLEM

Secondly, realizing that the numbers up to 7 seemed to indicate the best harmony, it occurred to me that Archimedes had used these

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fractions up to 7ths, in his famous Cattle Problem. I determined to derive some sort of solution to this problem based on the numbers of bulls, which were derived by Wurm in the last century. The numbers of the cows solved out to be decimal values up to ten thousandths, of a COW. I rationalized that possibly some cows were not all one pure color.

Then having these as a solution for eight entities, I entered them in the computer as a musical scale. They were all played, each note with each of the other seven notes as 2-note chords. To my surprise they were either curiously harmonic or were curiously, slightly inharmonic, as in a minor chord. This Cattle Problem then, may have been the relative tones of the "Music of the Spheres", or possibly, a variation of some ancient wave theory.

### I-CHING

In other reading on mathematics from ancient China, I came across the Book of Permutations. This book also had the eight characters, of which four were male and four were female. One of the males, Chien, was the leading male character, as the yellow bulls are a leading character in the problem of Archimedes. Both cases have 4 males and 4 females. They were in a different setting but the values in I-Ching were given as individual binary hexagrams. In combinations of 64 pairs of them they were claimed to produce certain results for purposes of prognostication.

A musical score could not be produced with only eight notes, so I took the eighteen low fractional values, up to 7ths, of each of these eight notes. At a certain pitch value these 144 notes had a selection of notes which would produce a scale which paralleled the chromatic scale within one or two hertz for each note. Using this scale to produce several popular songs on the computer, I found that there were some very unusual harmonics in these songs.

The music was pleasant, but listeners would invariably complain, after listening for several minutes. I found that, for several hours, after listening to these unusual chords, it would be im-

possible for me to relax and sleep.

### NOT ARCHIMEDES?

With these unusual results, I concluded this Cattle Problem must be a variation of the Music of the Spheres given to us by Archimedes. The results were very much in line with ancient legends of Sirens, Harp of Hermes, Pipes of Pan, and hundreds of other references. But with the I-Ching originating several thousand years before Archimedes, indicates that this problem was derived by Archimedes from translations of manuscripts which were then in the Library of Alexandria. Eratosthenes, who was their librarian possibly had had the translation made and advised Archimedes. Then Archimedes on setting the translation in the Cattle Problem, addressed the problem to Eratosthenes. Possibly neither one of them would have known of the harmonic content of the problem.

### QUANTUM PITCH

There is one major unknown in this music and that is knowledge of the proper pitch. This music must be played at a very precise pitch in order to replicate the frequencies which apply to the quantumness of nature. It is true that the video was destroyed three times. But of the millions of 2-note chords which were played, it required only one specific chord to destroy the electronics in the video. This music will not destroy any walls of Jericho. But one must realize that this musical experimentation can create danger.

### CASCADES

Another musical area was also investigated. This concerned the production of low tones from ultrasound. The computer would only produce frequencies up to four kilohertz. So one note at about 3.9 kilohertz was entered, and another, (harmonious), lower note at about 3 kilohertz was entered. Both of these were steady notes. Then a third variable note was played with them. In the incremental loop, its value varied from the second note to the first. Playing through



## PART II

### MUSIC OF THE SPHERES

This brings us to "Music Of The Spheres" which, also, originated long before Pythagoras. "Music of the Spheres", or "Song Celestial" is the subject of Archimedes problem "The Cattle Of Thrinacia". In Odyssey of Ulysses they are called "Cattle Of The Sun". Quantum Arithmetic dictates that the final solution consists of eight integers, all below the value of 10,000.

The values of the "male" notes are already integers. The remaining "female" notes will be within 0.002 per unit of an integer. Given those parameters, a solution is impossible to derive with conventional arithmetic. It is not impossible with Quantum Arithmetic, but it will be difficult until the full knowledge of this system of mathematics is better understood.

The four "male" notes are 891, 1580, 1602 and 2226. Their factors are: 2, 3, 5 & 7, along with one larger prime number between 7 and 100. This is in line with all of Quantum Arithmetic, and indeed, with chemistry, and astronomy which shall be demonstrated soon. Factors of these four notes are:  $891 = 3^4 \cdot 11$ ;  $1602 = 2 \cdot 3^2 \cdot 89$ ;  $1580 = 2^2 \cdot 5 \cdot 79$ ;  $2226 = 2 \cdot 3 \cdot 7 \cdot 53$ .

The female notes used were 754.95383, 1050.7297, 1197.965 and 1547.4254. Simplifying them to 756, 1050, 1197 & 1548 gives us  $756 = 2^2 \cdot 3^3 \cdot 7$ ;  $1050 = 2 \cdot 3 \cdot 5^2 \cdot 7$ ;  $1197 = 3^2 \cdot 7 \cdot 19$ ;  $1548 = 2^2 \cdot 3^2 \cdot 43$ . The primary basis of harmony lies in the numbers 2, 3, 5 and 7, and three or fewer larger primes, as factors. These integer values for the female notes all factor into the primes 2, 3, 5, 7, and one larger prime. The discrepancy between the integer plus decimal, and the factored integer is within the "Flexibility Factor" which is described later. That is the basis for their inclusion in Music of the Spheres.

### A MUSICAL SCALE?

These are only eight keynotes. Fractions of halves to sevenths of these notes must be added to each keynote to form a musical scale of 18 tones for that keynote. For the eight keynotes there will be a full scale of 144 tones. Since the keynotes harmonize, most of the secondary notes of each scale will also harmonize. Generated in this way, the 144 notes will have values from 796 to about 4000 falling within two and one half oc-

taves. This scale has real potential, but has not been fully investigated, nor understood. The reader can take it from there.

### HISTORY

Music has always been an art rather than a science. Under Quantum Arithmetic it becomes possible to study music as a mathematical science. Pythagoras introduced music as a science 2500 years ago in his working with strings of different lengths, relating them to the prime right triangles. According to Evans G. Valens, in "The Number of Things" pg. 24, Pythagoras, while at the "Temple of The Muses" in Crotona, Italy, believed that, "an orderly universe based upon numerical ratios and numbers, could account for the harmonious reality which underlies the confused appearance of the universe". Today, our science is torn between the chaos of the Universe and the extreme order of it. The latter applies particularly to things at the molecular scale. Quantum Arithmetic is finding that order applies throughout.

That this order existed everywhere, seems to have been discovered many millennia before Pythagoras. Since harmony derives from the fractional relationships, from halves to sevenths, as used by Archimedes I looked at the relationships more closely. The Cattle Problem which he proposed, contained these same fractions, but it went further than that. It contained three stages of fractions, of fractions, of fractions, in a sort of cataract. With that in mind I proceeded to work with the Cattle Problem from a musical point of view. I calculated all fourths, fifths, sixths and sevenths of each note and added this to the notes.

Using the values for the 18 note scales of each bull, which I had derived, I set these up as wavelengths and synthesized the tones. In pairs, they produced good harmony. Then deriving scales for the cows, these were added to the first four, making 144 tones. These male and female tones together, produced more harmonious and resonant chords.

### AND I-CHING

The setting of I-Ching and the Cattle is different but the characters are the same. The Cattle Problem gives complex proportions, one to another. But the Chinese setting gives each character a binary value. It then characterizes each

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character as having an influence in a specific area. It then places them in different pairs making a chord which is harmonious or discord in its influence. The two are different in these respects. One is subjective while the other is objective. There can be little doubt that these two settings evolve from the same natural source, and that source is Music of the Spheres. Their applications seem entirely different but both societies were aware of Music of the Spheres.

In China it was called "Song Celestial". In Odyssey, Ulysses lands his ship on the shore of an island where the sacred "Cattle of the Sun" are grazing, which is several hundred years before Pythagoras. The Book of Permutations from China, precedes the Cattle Problem by more than 3,000 years. And from India, Mahabharata (about 4,000 B. C.), refers often to "Song Celestial". This indicates that the Cattle Problem was not a direct derivation by Archimedes.

Eratosthenes or Archimedes derived it from manuscripts which were in the Library of Alexandria. Archimedes derived the problem and sent it to Librarian, Eratosthenes at the Library of Alexandria. The Library was sacked and burned between 50 B. C. and 640 A.D. The paper was found 1500 years later in the basement of the Vatican. But it is quite possible that neither Eratosthenes nor Archimedes knew the importance of the translation which he, or Eratosthenes, had made.

In the context we come up with today, the Cattle Problem seems, to be a simple statement of what we call wave theory, and theory of harmonics. These seem to be, eight keynote frequencies of eight different musical scales. With this thought, I expanded each of these eight notes to 18 for each musical scale. That gave a total of 144 tones. Each, tone would be expanded nearly one octave by having it generate other tones which were greater than itself by  $\frac{6}{7}$  to  $\frac{1}{7}$ ; by  $\frac{5}{6}$  to  $\frac{1}{6}$ ; by  $\frac{4}{5}$  to  $\frac{1}{5}$ ; and by  $\frac{3}{4}$  and  $\frac{1}{4}$ . The halves and thirds are taken care of in these higher fractions.

By synthesizing and playing these 144 tones in pairs, they generated many beautiful harmonious chords similar to the chords between the key-notes.

### BEATS

Within these chords were various tremolo rates which made them extraordinarily pleasant. There were very few, true discords. The discords were notorious, mainly for the faster reverberations, (or beats), which they created between certain pairs, creating unpleasant feelings. They also

caused the electronics used in their creation, to reverberate. That was when the video monitor blew up. These very low tone beats seemed to generate a sympathetic response within the electronics and within one's nervous system, particularly when there appeared to be harmony.

When the beat tone was less than six beats per second they generated pleasant feelings. From six to about 12 beats per second they generated feelings of activity. From twelve to twenty beats per second there was definite unease, if not actual panic. This response came not from the auditory senses but seemed to come directly as sympathetic bodily response. Other researchers have done work in this area and confirmed there is an emotional or mental effect. Above twenty-five beats per second the beats, (degenerated?), turned into bass tones in a cascade explained at the beginning of this chapter.

This range of vibratory waves, (or beats), from approximately 0.2 hertz to 30 hertz, becomes one of the Myriad scales. The Mental Myriad is formed as the energy cascades from the Musical Myriad of 10,000 different musical frequencies, to these lower, beat, frequencies. Edgar Cayce said, many times that music provides the opening to understanding all other parts of science. It appears that that opening is beginning to present itself.

### COMPOSITIONS

Selecting from the 144 notes, one set of notes which closely approximated three octaves of the chromatic scale, I preceded to play familiar songs with this scale. The songs appeared to be quite ordinary, except for one thing. That thing was the reverberation between notes when they appeared as two-note or three-note chords. Casual listeners enjoyed these songs for periods of only a few minutes. Longer than that, they found them objectionable, but could not define the cause of their objection. The variations in the reverberation, or beat, or some would call it the tremolo in the chords, was the cause. Listening to such a song for thirty minutes was sufficient to prevent sleep for several hours until the nerves had quieted down.

Choosing a different system of chords for a more uniform tremolo, removed that objection so long as the beats remained below four beats per second.

In this musical scale the formation of possible chords is tremendous. Any note can make an harmonious chord with nearly any other note. There are literally millions of such chords in, say, a 52

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note scale. The problem lies in the unacceptable reverberation rate within certain of them.

### PITCH

This still is not the Music of the Spheres. In order to be Music of the Spheres, it must be played at a very precise pitch for the basic scale. This, of course, is to be expected because quantum vibrations must be very precise. This is particularly true when one observes the wavelengths of the spectrographic lines of the elements. The unperturbed waves are at a precise and unchanging pitch.

Spacing between the different notes in Music of the Spheres, is also quite variable, very much like the spacing between the spectrographic lines of the elements. There are no "half tones". In the span between two of our normal notes there may appear as many as four or five notes in this scale. Or there may be a gap in the scale in which there is no note in a span of four half-tones.

Every piano tuner is familiar with the problem that no piano can be tuned to perfect octaves and still have uniform spacing between the half-tones. To that extent, when a piano is tuned by thirds or by fifths, the piano tuner must employ a certain amount of judgement. In Music of the Spheres, it appears that the perfect octave is sacrificed in favor of maintaining the order of the notes, and the quantumness of the scale.

In any scale of Music of the Spheres, the key-note cannot be distinguished. This brings up a question, "How do our ears know that a keynote is a keynote?" Are we able to relate certain ratios between notes of the scale, and the order in which those ratios fall? Then from this order of ratios, can we pick out the specific ratio which leads to the keynote? This seems to be a possibility. Does one learn to recognize a keynote, -- the note on which the song should end, - or is this an inborn capability? To an untrained ear, a keynote played by itself is unrecognizable from any other note. It is recognized only at the end of a series of notes, to provide a basis for recognition.

The capability of the complete scale of Music of the Spheres, appears to justify many of the ancient legends and stories of events in ancient times which involve music. There are hundreds of such examples: Greek Myth; Biblical; in the Hindu writings; and elsewhere. I-Ching implies that some of these specific vibratory rates are bombarding us to create the tendencies which it describes. One scientist, a member of International Keely Society, is investigating this possibility. He will eventually

tell of his findings.

### POETRY AND DANCE

Music has its tones; its vibrato; its beat; its measure; its phrases; and its stanzas. Each one can be considered as an aliquot part of the one following.

Poetry has very much the same organization. Each letter of a poem is like a note of music. Each syllable, each word, each meter or phrase, and each stanza follow in progression. Each is an aliquot part of the next. There are different meters in which a poem can be written, and that meter must be maintained for a specific period. The meter can be changed within a poem but a given meter must be maintained in most cases. Changing the meter changes the whole context of a piece of poetry. In effect, poetry is "quantum", and must maintain that quantumness order to be recognized as a valid poem.

Dance is the physical expression of music. A dancer on a stage can be likened to the playing of a flute solo. In a room full of dancers, with all dancing in pairs, (male and female), to a given dance pattern, the dancers maintain a uniform but dynamic pattern, in their steps and gyrations. The beauty and enjoyment of dancing is in its quantumness.

A room full of dancers can be likened to the movement of particles within an atom or a molecule. They are dancing in unison, (proton and neutron), with the music, with the poetic lyrics of the music, and with the music itself, all of which is quantumness in its dynamics, and coordination. The musicians are playing, but let them skip one note, or one beat, and the whole scene, turns into chaos. The quantumness is broken.

That people fall so naturally into this recognition of tune, time, and meter, seems to indicate there is an inborn capacity to recognize quantumness. This recognition can be enhanced by additional training. But to what extent is each person born with this capability?

It required nearly eight years to complete the sequences described above. The steps in the order they occurred:

(1) The research indicated that the primes 2, 3, 5 & 7 were important

(2) These numbers were used as fractions by Archimedes in the Cattle Problem, so it was solved.

# Quantum Arithmetic

(3) These eight values were set up as relative tones. They proved harmonic.

(4) Each tone was expanded to 18 notes for a total of 144 notes.

(5) A chromatic scale was made.

## WAVE NUMBERS

In harmonics, we should have learned that when two quantum numbers utilize four or more of the same prime factors, (within the four integers of the quantum number), they are HARMONIC. In addition to these four factors, they may have two or three more prime numbers in their makeup, one of which is unique to each wave. The prime numbers 2 and 3 must be in each, and they may also share a 5 or a 7 or both.

Perfect harmony is obtained only in nature. Man has been unable to create this perfect harmony, probably for the causes described below. Nature's harmony is found in the planets and stars. It is also found in the atoms of every element, with each element having its own harmony. It is found in sound and in visible light. The specific harmony describes the item to which it is related.

How do we find the musical scale of this perfect harmony? We have already found the part of the harmony, which we call chords of music, by some natural sense of music. We can also see the harmony in such places as the rainbow. But until now, we have been unable to put true number values to this harmony.

Each wavelength of energy has its own specific quantum number (b, e, d, a). The quantum number represents a specific ellipse or set of ellipses which generate that wavelength. The wavelength of energy must be represented in natural units instead of our invented units. Those natural numbers are derived through "quantizing" of the empirical data.

The empirical measurements of an ellipse usually give the perigee and apogee, but an empirical ellipse can also be quantized with only the ellipticity given. In this case the quantization is relative. When quantizing from this empirical data, the natural quantum measurements can be regarded as relative to each other. Ellipticity is a ratio which is an analog of the ratios,  $b/a$  and  $e/d$ . They can be returned to conventional units at any time. This relative quantum number depends upon the "truth factor" which is used. (See Line 10, "y<sup>2</sup>", of program "Quantize").

## TRUTH FACTOR

At the lowest truth value, the quantum number comes within reason, but it should be able to return to within the last two digits of the input data. It depends on the validity of the assumption of accuracy of the empirical data. Empirical data which is not accurate within 1% cannot be quantized. (i.e. Moon orbit cannot be quantized because it is too inaccurate.)

The variation between the empirical and the quantum data should not change more than 0.01%. The integers of the quantum number should all be less than 100, with a correct truth factor. If too severe a truth factor is used the quantum number will be too high and will factor differently.

## FACTORING

Say we take two integers, 128 and 64. They  $2/128$  &  $1/64$  will factor the same. Then add one unit in each case. This will become  $2/129$  and  $1/65$ . These are basically the same number values in relation to all others, under a given truth factors, but they will factor entirely differently,  $2/129 = 2/(3 \times 43)$ , but  $1/65 = 1/(5 \times 13)$ . The 65 is much more dependable because it has lower prime numbers. That is critical in determining the aliquot parts.

## ALIQUOT PARTS

Each wave can be broken down into aliquot units of: 6-units, (2x3); 30-units, (2x3x5); 42 units, (2x3x7); Or 210-units, (2x3x5x7). These aliquot partial waves are the most fundamental breakdown, and can be considered as Harmonic Cycles. The most significant breakdown will probably be some prime multiple of 30 or 42.

For further explanation one must refer to the "Rubber Band" hypothesis which is posed in Volume III of *Pythagoras And The Quantum World*, (1985). This hypothesis rates the specific areas of stable vs. weak quantum status over very short bandwidths. Each quantum wave can be pictured as riding in its own trough, or bandwidth. The lower the point in the trough, that is, the lower the prime factors, the stronger will be the quantum. Between adjacent troughs is a peak, over which a quantum jump can be made. It is a case of stability of a given quantum frequency. Stability, rather than strength, is the leading parameter. In practical application, any ellipse will be pulled or pushed out of this central position by perturbation. The "Rubber Band Hypothesis" derives from

## Quantum Arithmetic

a mathematical feature showing strength of quantization and not strength of the energy. It will require further empirical testing to verify what sort of truth value is to be used, and how to obtain it. Quantization and empirical testing must go hand-in-hand with each assisting the other.

There are two variables in Program Quantize which affect the truth of calculated relativity between two items.

It is for this reason that the correct truth value must be used. That truth value should give results somewhere between 1:5000 and 1:10000.

When a spectrogram is taken of any chemical, or element, the lines are usually given in angstroms. This is the wavelength of the "color" of each spectrographic line. They are used here as they are represented in "CRC Handbook of Chemistry and Physics" (1973). These can be assumed to represent the ellipticity of the ellipse which that generates color wavelength. The ellipse is taken to be the elliptical path which an electron is following, at its respective energy state. In the case described below the ellipse must be considered to be only a "picture" of the relative mathematical relationship between colors.

Any energy state is relative to all other energy states, so long as the input data remains uniform. The separation between spectral lines will then represent the quantum changes in frequencies of energies between states of an electron.

In a single atom, all energy states are not occupied simultaneously, and an electron does not necessarily jump to the state which adjoins it in the table. Likewise, the difference in quantum numbers represents a quantum change in energy frequencies. They become relative in natural quantum units, just as the empirical measurements were relative, (in angstroms), but were not quantum.

This is accomplished through Program Quantize. The input will be the ellipticity in decimal form for the perigee and unity for the apogee.

### THE QUANTUM ELLIPSE

A short review of the previous chapter in Book #1, will show that for any ellipse, the semi-major diameter must be a square number. If the semi-major diameter is not the square of an integer, the ellipse can be expanded or shrunk until it becomes a square integer, (D). (That is to say, the unit of measure is changed to some abstract, natural unit of measure.) After the correct square

number for the semi-major diameter is found, then the products of its square root, (d), and three other integers, (b, e, & a), will give all other measurements, including the other three measurements along the major diameter. These will be: db, de,  $d^2$  and da, retaining them in Fibonacci configuration. The four integers b, e, d, & a, dictate the natural quantum number for that quantum ellipse. More detail is given in Books #1 & #2.

The exact same procedure can be followed without quantizing, but then none of the measurements can be factored and prime numbers cannot be recognized. (See Problems 7 & 8 on page 15 of Book 2.)

In the natural Quantum Number, e & d must be coprime; and since Euclid Book VII, Proposition 28, claims that their sum (a), and their difference (b), will be prime to both e & d this quantum number will be unique and differentiated from all other spectral lines which have their own unique Quantum Number.

### BREAKING DOWN THE WAVE

After the natural Quantum Number is derived, the four integers of that quantum number are factored to further break them down into their prime factors. Every Quantum Number will have the factors 2, and 3 represented in it. It should also have either a 5 or a 7, or both, among its factors. It may have other prime factors up to a total of seven, for males, and up to six for females. Male quantum numbers may have a minimum of four factors. Females may have a minimum of three prime factors. These factors are the origin of the quantumness in nature.

### TRUTH DETERMINATION

All spectrographic lines of twenty of the most common elements were Quantized. After the Quantum Numbers were derived, and factored, the factors of sodium and chlorine were catalogued in a data set. The quantum numbers for Hydrogen, Carbon & Oxygen, (hydrocarbons), were in another set.

Sodium and Chlorine, using a truth value of one part per million had five correlating prime numbers in each, (2x3x5x13x47). At a truth of one part per million, Chlorine Line #38 quantized, with factors of 2, 3, 5, 7, 13, 47 and missed the input check by 0.001 angstrom. Sodium line #15 quantized at 94, 265, 359, 624, (which was far too high). It had the factors 2, 3, 5, 13, 47, 53, 359. The Chlorine and Sodium both had the common factors of 2, 3, 5, 13 & 47, with Chlorine having 7

## Quantum Arithmetic

as its unique factor. Sodium had 53 as its unique factor. An extra factor 359, appeared as a factor. The 359 should have been 360 whose factors increase the powers of the 2, 3 & 5 and eliminates the 359. This analysis of waves is entirely mathematical.

The assumed truth was too high. Again, Sodium and Chlorine were quantized at a reduced truth factor of one part in 40,000. The quantization is right but the empirical data still has more error than allowed. It appears that the truth factor should be one part in 5040. Y should be  $1/71$  which equals  $1/\sqrt{5040}$ . These factors were put through the data set to find correlating lines. The quantization and the correlation of factors are shown at the end of this chapter.

The truth level is critical.

An original quantizing was done at an accuracy of one part per million. At that level, other parameters enter the picture to cloud the outcome.

The tables at the end of this chapter are based on a truth value of 1 part in 40,000. All spectrographic lines are included to demonstrate what can be done.

### EXAMPLES

Spectral lines of a hydrogen energy state correlated with spectral lines of an oxygen energy state in five different cases. The eight energy lines of hydrogen showed three cases of utmost harmony within themselves. (Not shown).

One can hypothesize that correlation between a certain energy state of one element, and a certain energy state of another may form a bonding between the two of them at this point. The bonding should occur when there is a correlation between aliquot parts of the two energy states. Quantization can locate these energy states, but it must be done correctly and then substantiated, if possible by empirical testing.

### QUANTIZED STATES

The last pages of this chapter consist of quantization and classification of all energy states of sodium and chlorine. These are made available to demonstrate what can be done with Quantum Arithmetic. Certain assumptions can be made, and some of the weak points can be explored.

The first four pages are the quantization of Sodium electron states, and the factors of those states. The first two pages are the quantization,

and factoring. The 3rd and 4th pages give the factors, first in the order of increasing wavelengths, then in the order of their factors.

The next six pages are the same order for Chlorine. The last two pages combine Sodium and Chlorine prime factors in the order of increasing size of the prime factors. Somewhere in these last two pages should give some indication of the bonding point of Sodium and Chlorine to form table salt, NaCl.

The quantization is accomplished by using an assumed unit of measure which is 10,000 angstroms. In this unit, all spectrographic lines become decimals for the perigee of an ellipse, and one unit is used for the apogee. This is the input, which is given in angstrom units. After that is given the angstrom units are reconstructed from the quantization. This is given to indicate that no troubles have occurred in the calculation. It consists of  $N/Q \times 10,000$ .

The largest wavelength is slightly less than 2,000 angstroms. The 10,000 used above would probably give more reliable results if the unit of measure had been taken as 4,000 angstroms maximum, so we would be working between the fractions of zero to  $1/2$ . Harmonics and Music of The Spheres indicate these would have been a better choice. As it is the quantizations occur between zero and  $1/5$  for  $N/Q$ . The relativity between energy states still exists, but the prime factors have come out differently than would have occurred with the lower unit.

### EVALUATION

On the last page of the tables, Sodium is given as quantizing Line 301.32 angstroms, with the prime factors of 2, 3, 5, 7, 19, 23 & 83. Chlorine quantizes Line 1565.05 angstroms with the prime factors 2, 3, 5, 7, 19, 23 & 97.

They differ by only the very last prime factor. From previous indications, these two lines will harmonize very strongly. They will have sympathetic vibration between them according to these calculations.

There are many other such harmonics. In the table: (Page 41 & 42) line 23 & 24; line 30 & 31; line 41 & 42; line 45 & 46; line 49 & 50; line 53 & 54; 58 & 59; and many others will harmonize in pairs.

One can suppose this correlation between these two energy states of electrons may form a bonding, between sodium and chlorine, at this

## Quantum Arithmetic

point. Whether this conclusion is correct or not, this example demonstrates what can be done to furnish more mathematically precise information within chemistry. This effectively, takes out the empiricism, and eliminates many uncertainties, if proper judgement is used.

### CONCLUSION

This demonstration of breaking empirical waves into their aliquot parts, was made in connection with chemistry. The same process will apply, without change, in waves of any denomination be they color or heat or astronomic cycles or musical tones.

An original ambient wave, as found in nature, is never a true sine wave. Many of them can approach the shape of a sine wave, but will be modulated by smaller waves. The complete wave will closely resemble the path of a planet as it is perturbed from its orbit by gravitational pull from numerous other bodies. The other bodies will, likewise, be pulled or pushed from their perfect orbits by the first.

A sinusoidal projection of Earth's elliptical orbit, will show waverings, where the Earth is pushed out of its ideal orbit. This occurs about 13 times each year by the Moon which shoves the earth aside by 3,000 miles. Other smaller deviations are caused by the planets. The annual orbit of Earth will project into a sine wave, but the sine curve will have irregularities. The same thing will apply to Mars and Venus our nearest neighbors. Each of these will have waverings similar to that of Earth. In matching that of Earth they will have the same applicable prime numbers. These mutual waverings will act as cogs on a wheel, like gears in a clock, tying the whole planetary system together. Each gear will have a prime number of "teeth".

When Quantum Numbers are assigned to the orbits of all planets, their minor modulations will match with others nearby. This is the basis of harmony. The minor modulation cycles of an individual orbit or wave represents its unique "harmonic". When two or more such waves or cycles have enough similar prime number values, they can be said to be "in harmony".

### TABLES

The following pages show the quantization of 42 spectrographic lines for Sodium, and 80 lines for Chlorine. The lines are given, in both cases, in the order of their frequency.

The first line shows: The element; the sequence number of the energy state; The quantum number of that line; The empirical value for that line, in angstroms; And the derived quantum value. The second line gives the factors of the quantum number, for determination of its aliquot parts.

The next step on pages 37 & 38, correlates the factors and lists them in the order they were quantized. Page 38 then reorders them in a data set. Pages 39 through 45 does the same for the 80 energy states of Chlorine. Pages 46, 47 & 48 correlates the energy states of Sodium and Chlorine by their factors. Those lines which have the most identical sets of factors in the two data sets, will appear together. These sets of factors are still not the true set because the truth factor is still set at one magnitude too high.

These tables should be considered only as a demonstration of what can be done with Quantum Arithmetic. The prime factors for many lines are still above 100 and in the area of instability. In this demonstration, the truth value is still too strict, and the value of the unit of measure, (10,000 angstroms per unit), certainly is not correct.

The empirical measurement in Angstroms is clearly better than metric measurement. But if the length of one angstrom is not within one-tenth percent of what the natural measure should be it will lead to errors in quantization.

At this point Quantum Arithmetic with its absolutism is far ahead of empirical research. Empirical research can be upgraded with the application of Quantum Arithmetic and that is the next step in making progress.

There are many features which become apparent in these tables. Deficiencies in knowledge of the true values of natural parameters prevents attainment of the required absolutes in Quantum Arithmetic. Deficiencies in instrument calibration for empirical research will often lead to wrong diagnoses. But the two, working together can achieve phenomenal progress.

In the present state, quantization can indicate where harmony probably exists between widely different frequencies. But the natural state requires more accuracy on all fronts, whether it is in the range of visible light, the ranges of audible and ultrasound, and even in the ranges of astronomy. It may even show us the way in the ranges of magnetism and gravity.

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At the more strict truth value, (one part per million), the empirical wavelength matches precisely with the quantum wavelength, but the quantum number is far too high to be reasonable. When the truth value of empirical values is reduced to one part in 10,000, the match between the empirical and natural values will vary but the quantum numbers still will not factor within the requirements of Quantum Arithmetic. It becomes apparent that the unit to be used in these tables is one part in 5040 units.

The reader may note that when a factor is carried to a power only the base prime is entered in the data set. This is necessary in order to classify according to prime numbers only.

This same process is used with music to derive the correct pitch for notes of Music of the

Spheres. In astronomy, the empirical values have been used. Here have been found flagrant errors in measurement. All of the planets quantized quite well but their satellites were too far in error to achieve quantization. This applies particularly to our own Moon. On reviewing past encyclopedia editions, McGraw-Hill, various editions vary widely in the distance to our own Moon. This occurs because two elliptical movements are involved. One movement is around the Earth, and the other is parallel to Earth axis.



# Quantum Arithmetic

## QUANTIZATION & factoring of 44 Spectrographic, Sodium Lines

SODIUM # 1 QUANT FACTORS=	#= 6 97 16 3	25	103 97	200 103 ( 1 )	ANGSTROM= 300.15 (TRUE= 300)
SODIUM # 2 QUANT FACTORS=	#= 6 97 16 3	25	103 97	103 ( 1 )	ANGSTROM= 300.2 (TRUE= 300)
SODIUM # 3 QUANT FACTORS=	#= 10 161 8 9	171 5	332 7	19 23 83 ( 1 )	ANGSTROM= 301.32 (TRUE= 301.204819)
SODIUM # 4 QUANT FACTORS=	#= 11 177 4 3	188 5	365 11	47 59 73 ( 1 )	ANGSTROM= 301.44 (TRUE= 301.369863)
SODIUM # 5 QUANT FACTORS=	#= 1 16 16 3	17 11	33 17 ( 1 )		ANGSTROM= 302.45 (TRUE= 303.030303)
SODIUM # 6 QUANT FACTORS=	#= 1 13 2 27	14 7	27 13 ( 1 )		ANGSTROM= 372.08 (TRUE= 370.37037)
SODIUM # 7 QUANT FACTORS=	#= 9 115 4 9	5	124 23	239 31 149 ( 1 )	ANGSTROM= 376.38 (TRUE= 376.569038)
SODIUM # 8 QUANT FACTORS=	#= 11 37 16 3	48 5	85 11	17 37 ( 1 )	ANGSTROM= 1293.97 (TRUE= 1294.11765)
SODIUM # 9 QUANT FACTORS=64	#= 15 49 3 5	64 49	113 113 ( 1 )		ANGSTROM= 1327.74 (TRUE= 1327.43363)
SODIUM # 10 QUANT FACTORS= 16	#= 19 61 3 5	80 19	141 47	61 ( 1 )	ANGSTROM= 1347.54 (TRUE= 1347.51773)
SODIUM # 11 QUANT FACTORS=64	#= 22 69 3 5	91 7	160 11	13 23 ( 1 )	ANGSTROM= 1374.89 (TRUE= 1375)
SODIUM # 12 QUANT FACTORS=4	#= 17 52 3 121	69 13	121 17	23 ( 1 )	ANGSTROM= 1404.68 (TRUE= 1404.95868)
SODIUM # 13 QUANT FACTORS=64	#= 32 91 3 7	123 13	214 41	107 ( 1 )	ANGSTROM= 1495.21 (TRUE= 1495.3271)
SODIUM # 14 QUANT FACTORS=2	#= 19 54 27 19	73 73	127 127 ( 1 )		ANGSTROM= 1496.01 (TRUE= 1496.06299)
SODIUM # 15 QUANT FACTORS=8	#= 31 88 9 7	119 11	207 17	23 31 ( 1 )	ANGSTROM= 1497.73 (TRUE= 1497.58454)
SODIUM # 16 QUANT FACTORS=2	#= 11 31 3 7	42 11	73 31	73 ( 1 )	ANGSTROM= 1506.41 (TRUE= 1506.84932)
SODIUM # 17 QUANT FACTORS=2	#= 11 31 3 7	42 11	73 31	73 ( 1 )	ANGSTROM= 1506.91 (TRUE= 1506.84932)
SODIUM # 18 QUANT FACTORS=4	#= 41 115 3 5	156 13	271 23	41 149 ( 1 )	ANGSTROM= 1513.1 (TRUE= 1512.91513)
SODIUM # 19 QUANT FACTORS=8	#= 19 53 9 125	72 19	125 53 ( 1 )		ANGSTROM= 1519.63 (TRUE= 1520)
SODIUM # 20 QUANT FACTORS=	#= 31 2 3	78 11	109 13	187 31 109 ( 1 )	ANGSTROM= 1657.92 (TRUE= 1657.75401)
SODIUM # 21 QUANT FACTORS=4	#= 35 81 81 5	116 7	197 29	149 ( 1 )	ANGSTROM= 1776.57 (TRUE= 1776.64975)
SODIUM # 22 QUANT FACTORS=32	#= 16 37 9 5	53 37	90 53 ( 1 )		ANGSTROM= 1778.24 (TRUE= 1777.77778)
SODIUM # 23 QUANT FACTORS=4	#= 23 53 3 19	129 23	43 53 ( 1 )		ANGSTROM= 1783.04 (TRUE= 1782.94574)

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SODIUM # 24 QUANT #= FACTORS=	37 2	85 9	122 5	207 17	23	ANGSTROM= 1787.19 (TRUE= 1787.43961) 37 61 ( 1 )
SODIUM # 25 QUANT #= FACTORS=	44 8	101 3	145 5	246 11	29	ANGSTROM= 1788.85 (TRUE= 1788.61789) 41 101 ( 1 )
SODIUM # 26 QUANT #= FACTORS=	25 2	57 3	82 25	139 19	41	ANGSTROM= 1798.41 (TRUE= 1798.56115) 139 ( 1 )
SODIUM # 27 QUANT #= FACTORS=	29 2	66 3	95 5	161 7	11	ANGSTROM= 1801.26 (TRUE= 1801.24224 ) 19 23 29 (1)
SODIUM # 28 QUANT #= FACTORS=	15 2	34 3	49 5	83 49	17	ANGSTROM= 1807.09 (TRUE= 1807.22892) 83 ( 1 )
SODIUM # 29 QUANT #= FACTORS=	34 8	77 3	111 7	188 11	17	ANGSTROM= 1808.38 (TRUE= 1808.51064) 37 47 ( 1 )
SODIUM # 30 QUANT #= FACTORS=	45 2	101 9	146 5	247 13	19	ANGSTROM= 1821.7 (TRUE= 1821.86235) 73 101 ( 1 )
SODIUM # 31 QUANT #= FACTORS=	53 2	118 9	171 17	289 17	19	ANGSTROM= 1833.87 (TRUE= 1833.91003) 53 59 ( 1 )
SODIUM # 32 QUANT #= FACTORS=	49 2	109 3	158 49	267 89	109	ANGSTROM= 1835.22 (TRUE= 1835.20599) 149 ( 1 )
SODIUM # 33 QUANT #= FACTORS=	9 4	20 9	29 5	49 49	29	ANGSTROM= 1837.89 (TRUE= 1836.73469) ( 1 )
SODIUM # 34 QUANT #= FACTORS=	14 8	31 9	45 5	76 7	19	ANGSTROM= 1841.82 (TRUE= 1842.10526) 31 ( 1 )
SODIUM # 35 QUANT #= FACTORS=	19 2	42 3 7	61 19	103 61	103	ANGSTROM= 1845.02 (TRUE= 1844.66019) ( 1 )
SODIUM # 36 QUANT #= FACTORS=	5 16	11 27	16 5	27 11	( 1 )	ANGSTROM= 1850.15 (TRUE= 1851.85185)
SODIUM # 37 QUANT #= FACTORS=	5 16	11 27	16 5	27 11	( 1 )	ANGSTROM= 1851.19 (TRUE= 1851.85185)
SODIUM # 38 QUANT #= FACTORS=	5 16	11 27	16 5	27 11	( 1 )	ANGSTROM= 1853.17 (TRUE= 1851.85185)
SODIUM # 39 QUANT #= FACTORS=	28 8	61 3	89 25	150 7	61	ANGSTROM= 1866.45 (TRUE= 1866.66667) 89 ( 1 )
SODIUM # 40 QUANT #= FACTORS=	6 64	13 3	19 13	32 19	( 1 )	ANGSTROM= 1873.37 (TRUE= 1875)
SODIUM # 41 QUANT #= FACTORS=	6 64	13 3	19 13	32 19	( 1 )	ANGSTROM= 1875.08 (TRUE= 1875)
SODIUM # 42 QUANT #= FACTORS=	51 2	110 3	161 5	271 7	11	ANGSTROM= 1881.91 (TRUE= 1881-.91882) 17 23 149 (1)
SODIUM # 43 QUANT #= FACTORS=	46 8	99 9	145 5	244 11	23	ANGSTROM= 1885.09 (TRUE= 1885.2459) 29 61 ( 1 )
SODIUM # 44 QUANT #= FACTORS=	33 8	71 3	104 25	175 7	11	ANGSTROM= 1885.74 (TRUE= 1885.71429) 13 71 ( 1 )

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### DATA SET OF FACTORS OF 44 SODIUM LINES -- (By wavelength)

Element	Line	Angstrom	Factor	3	5	7	11	13	17	19	23
Sodium	#01	0300.15	2	3	5	97	103				
Sodium	#02	0300.20	2	3	5	97	103				
Sodium	#03	0301.32	2	3	5	7	19	23	83		
Sodium	#04	0301.44	2	3	5	11	47	59	73		
Sodium	#05	0302.45	2	3	11	17					
Sodium	#06	0372.08	2	3	7	13					
Sodium	#07	3746.38	2	3	5	23	31	6.3.13	Faulty factors		
Sodium	#08	1293.97	2	3	5	11	17	37			
Sodium	#09	1327.74	2	3	5	7	113				
Sodium	#10	1347.54	2	3	5	19	47	61			
Sodium	#11	1374.69	2	3	5	7	11	13	23		
Sodium	#12	1404.68	2	3	11	13	17	23			
Sodium	#13	1495.21	2	3	7	13	41	107			
Sodium	#14	1496.01	2	3	19	73	127				
Sodium	#15	1497.73	2	3	7	11	17	23	31		
Sodium	#16	1506.41	2	3	7	11	31	73			
Sodium	#17	1506.91	2	3	7	11	31	73			
Sodium	#18	1543.10	2	3	5	13	23	41	6.9.5	Faulty factors	
Sodium	#19	1519.63	2	3	5	19	53				
Sodium	#20	1657.92	2	3	11	13	17	31	109		
Sodium	#21	1776.57	2	3	5	7	29	197			
Sodium	#23	1783.04	2	3	19	23	43	53			
Sodium	#22	1778.24	2	3	5	37	53				
Sodium	#24	1787.19	2	3	5	17	23	37	61		
Sodium	#25	1788.85	2	3	5	11	29	41	101		
Sodium	#26	1798.41	2	3	5	19	41	139			
Sodium	#27	1801.26	2	3	5	7	11	19	23	29	
Sodium	#28	1807.09	2	3	5	7	17	83			
Sodium	#29	1808.38	2	3	7	11	17	37	47		
Sodium	#30	1821.70	2	3	5	13	19	73	101		
Sodium	#31	1833.87	2	3	17	19	53	59			
Sodium	#32	1835.22	2	3	7	79	89	109			
Sodium	#33	1837.89	2	3	5	7	29				
Sodium	#34	1841.82	2	3	5	7	19	31			
Sodium	#35	1845.02	2	3	7	19	61	103			
Sodium	#36	1850.15	2	3	5	11					
Sodium	#37	1851.19	2	3	5	11					
Sodium	#38	1853.17	2	3	5	11					
Sodium	#39	1866.45	2	3	5	7	61	89			
Sodium	#40	1873.37	2	3	13	19					
Sodium	#41	1875.08	2	3	13	19					
Sodium	#42	1881.91	2	3	5	7	11	17	23	271	
Sodium	#43	1885.09	2	3	5	11	23	29	61		
Sodium	#44	1885.74	2	3	5	7	11	13	71		

## Quantum Arithmetic

DATA SET OF 44 SODIUM LINES (by Precedence of Factors)

Element	Line	Angstrom	Factor--)	3	5	7	11	13	17	19	23
Sodium	#12	1404.68	2	3	11	13	17	23			
Sodium	#20	1657.92	2	3	11	13	17	31	109		
Sodium	#05	0302.45	2	3	11	17					
Sodium	#40	1873.37	2	3	13	19					
Sodium	#41	1875.08	2	3	13	19					
Sodium	#31	1833.87	2	3	17	19	53	59			
Sodium	#23	1783.04	2	3	19	23	43	53			
Sodium	#14	1496.01	2	3	19	73	127				
Sodium	#15	1497.73	2	3	7	11	17	23	31		
Sodium	#29	1808.38	2	3	7	11	17	37	47		
Sodium	#17	1506.91	2	3	7	11	31	73			
Sodium	#16	1506.41	2	3	7	11	31	73			
Sodium	#06	0372.08	2	3	7	13					
Sodium	#13	1495.21	2	3	7	13	41	107			
Sodium	#35	1845.02	2	3	7	19	61	103			
Sodium	#32	1835.22	2	3	7	79	89	109			
Sodium	#38	1853.17	2	3	5	11					
Sodium	#36	1850.15	2	3	5	11					
Sodium	#37	1851.19	2	3	5	11					
Sodium	#08	1293.97	2	3	5	11	17	37			
Sodium	#43	1885.09	2	3	5	11	23	29	61		
Sodium	#25	1788.85	2	3	5	11	29	41	101		
Sodium	#04	0301.44	2	3	5	11	47	59	73		
Sodium	#30	1821.70	2	3	5	13	19	73	101		
Sodium	#18	1513.10	2	3	5	13	23	41	6.9.5	Faulty	
Sodium	#24	1787.19	2	3	5	17	23	37	61		
Sodium	#26	1798.41	2	3	5	19	41	139			
Sodium	#10	1347.54	2	3	5	19	47	61			
Sodium	#19	1519.63	2	3	5	19	53				
Sodium	#07	0376.38	2	3	5	23	31	6.3.13	Faulty		
Sodium	#22	1778.24	2	3	5	37	53				
Sodium	#02	0300.20	2	3	5	97	103				
Sodium	#01	0300.15	2	3	5	97	103				
Sodium	#11	1374.69	2	3	5	7	11	13	23		
Sodium	#44	1885.74	2	3	5	7	11	13	71		
Sodium	#42	1881.91	2	3	5	7	11	17	23	271	
Sodium	#27	1801.26	2	3	5	7	11	19	23	29	
Sodium	#09	1327.74	2	3	5	7	113				
Sodium	#28	1807.09	2	3	5	7	17	83			
Sodium	#03	0301.32	2	3	5	7	19	23	83		
Sodium	#34	1841.82	2	3	5	7	19	31			
Sodium	#33	1837.89	2	3	5	7	29				
Sodium	#21	1776.57	2	3	5	7	29	197			
Sodium	#39	1866.45	2	3	5	7	61	89			

Corrected in later run

# Quantum Arithmetic

## QUANTIZATION & Factoring of 80 Spectrographic Chlorine Lines

CHLORINE # 1 FACTORS=	QUANT #= 4 9 5	76 7	85 17	161 19	ANGSTROM= 559.305 23 (1)	TRUE= 559.006211
CHLORINE # 2 FACTORS=	QUANT #= 8 3 5	33 7	37 11	70 37	ANGSTROM= 571.904 (1)	TRUE= 571.428572
CHLORINE # 3 FACTORS=	QUANT #= 2 3 5	41 23	46 29	87 41	ANGSTROM= 574.406 (1)	TRUE= 574.712644
CHLORINE # 4 FACTORS=	QUANT #= 8 9 17	8 (1)	9	17	ANGSTROM= 586.24	TRUE= 588.235294
CHLORINE # 5 FACTORS=	QUANT #= 2 3 25	129 11	146 17	275 43	ANGSTROM= 618.057 73 (1)	TRUE= 618.181818
CHLORINE # 6 FACTORS=	QUANT #= 32 3 121	121 43	137 137	258 (1)	ANGSTROM= 619.982	TRUE= 620.155039
CHLORINE # 7 FACTORS=	QUANT #= 32 3 121	121 43	137 137	258 (1)	ANGSTROM= 620.298	TRUE= 620.155039
CHLORINE # 8 FACTORS=	QUANT #= 2 3 5	157 7	178 67	335 89	ANGSTROM= 626.735 139 (1)	TRUE= 626.865672
CHLORINE # 9 FACTORS=	QUANT #= 4 81 11	81 23	92 139	173 (1)	ANGSTROM= 635.881	TRUE= 635.83815
CHLORINE # 10 FACTORS=	QUANT #= 2 3 125	125 17	142 71	267 89	ANGSTROM= 636.626 (1)	TRUE= 636.70412
CHLORINE # 11 FACTORS=	QUANT #= 2 9 5	79 11	90 169	169 139	ANGSTROM= 650.894 (0)	TRUE= 650.887574
CHLORINE # 12 FACTORS=	QUANT #= 4 3 5	92 7	105 13	197 23	ANGSTROM= 659.811 139 (1)	TRUE= 659.898477
CHLORINE # 13 FACTORS=	QUANT #= 32 9 5	127 17	145 29	272 127	ANGSTROM= 661.841 (1)	TRUE= 661.764706
CHLORINE # 14 FACTORS=	QUANT #= 16 3 169	169 139	193 139	362 (1)	ANGSTROM= 663.074	TRUE= 662.983425
CHLORINE # 15 FACTORS=	QUANT #= 16 3 11	41 41	47 47	88 (1)	ANGSTROM= 682.053	TRUE= 681.818182
CHLORINE # 16 FACTORS=	QUANT #= 8 27 7	88 11	101 13	189 101	ANGSTROM= 687.656001 (1)	TRUE= 687.830688
CHLORINE # 17 FACTORS=	QUANT #= 2 27 7	47 47	54 101	101 (1)	ANGSTROM= 693.594	TRUE= 693.069308
CHLORINE # 18 FACTORS=	QUANT #= 32 3 5	32 23	37 37	69 (1)	ANGSTROM= 725.271001	TRUE= 724.637682
CHLORINE # 19 FACTORS=	QUANT #= 64 2 3	89 7	103 89	192 103	ANGSTROM= 728.951001 (1)	TRUE= 729.16666-
CHLORINE # 20 FACTORS=	QUANT #= 8 9 5	83 7	97 83	180 97	ANGSTROM= 777.562001 (1)	TRUE= 777.777778
CHLORINE # 21 FACTORS=	QUANT #= 4 3 5	76 11	89 13	165 19	ANGSTROM= 787.58 89 (1)	TRUE= 787.878788

## Quantum Arithmetic

CHLORINE # 22 FACTORS=	QUANT #= 2 9 25	146 19	171 73	317 139	ANGSTROM= 788.74 TRUE= 788.643533 ) ( 1 )
CHLORINE # 23 FACTORS=	QUANT #= 2 9 5	29 7	34 17	63 29	ANGSTROM= 793.342001 TRUE= 793.650794 ) ( 1 )
CHLORINE # 24 FACTORS=	QUANT #= 4 3 5	60 11	71 71	131 131	ANGSTROM= 839.297 TRUE= 839.694657 ( 1 )
CHLORINE # 25 FACTORS=	QUANT #= 4 3 5	60 11	71 71	131 131	ANGSTROM= 839.598999 TRUE= 839.694657 ( 1 )
CHLORINE # 26 FACTORS=	QUANT #= 2 9 49	49 29	58 107	107 ( 1 )	ANGSTROM= 841.41 TRUE= 841.121495 ( 1 )
CHLORINE # 27 FACTORS=	QUANT #= 4 27 5	145 29	172 43	317 139	ANGSTROM= 851.691 TRUE= 851.735016 ( 1 )
CHLORINE # 28 FACTORS=	QUANT #= 2 3 7	118 23	141 37	259 47	ANGSTROM= 888.026 TRUE= 888.030888 ( 1 )
CHLORINE # 29 FACTORS=	QUANT #= 64 2 3	107 5	128 7	235 47	ANGSTROM= 893.549 TRUE= 893.617021 ( 1 )
CHLORINE # 30 FACTORS=	QUANT #= 16 3 5	47 13	57 19	104 47	ANGSTROM= 961.499 TRUE= 961.538461 ( 1 )
CHLORINE # 31 FACTORS=	QUANT #= 4 27 5	135 13	164 23	299 29	ANGSTROM= 969.92 TRUE= 969.899666 ( 1 )
CHLORINE # 32 FACTORS=	QUANT #= 16 9 23	83 83	101 101	184 ( 1 )	ANGSTROM= 978.284 TRUE= 978.26087 ( 1 )
CHLORINE # 33 FACTORS=	QUANT #= 8 9 5	9 11	11 ( 1 )	20 ( 1 )	ANGSTROM= 998.372 TRUE= 1000 ( 1 )
CHLORINE # 34 FACTORS=	QUANT #= 8 9 5	9 11	11 ( 1 )	20 ( 1 )	ANGSTROM= 998.432 TRUE= 1000 ( 1 )
CHLORINE # 35 FACTORS=	QUANT #= 8 9 5	9 11	11 ( 1 )	20 ( 1 )	ANGSTROM= 1002.346 TRUE= 1000 ( 1 )
CHLORINE # 36 FACTORS=	QUANT #= 16 3 5	133 7	163 19	296 37	ANGSTROM= 1013.664 TRUE= 1013.51351 ( 1 )
CHLORINE # 37 FACTORS=	QUANT #= 16 3 5	35 7	43 13	78 43	ANGSTROM= 1025.553 TRUE= 1025.64103 ) ( 1 )
CHLORINE # 38 FACTORS=	QUANT #= 2 3 5	21 7	26 13	47 47	ANGSTROM= 1063.831 TRUE= 1063.82979 ) ( 1 )
CHLORINE # 39 FACTORS=	QUANT #= 2 3 11	46 19	57 23	103 103	ANGSTROM= 1067.945 TRUE= 1067.96117 ( 1 )
CHLORINE # 40 FACTORS=	QUANT #= 16 3 25	25 7	31 31	56 ( 1 )	ANGSTROM= 1071.036 TRUE= 1071.42857 ) ( 1 )
CHLORINE # 41 FACTORS=	QUANT #= 16 3 25	25 7	31 31	56 ( 1 )	ANGSTROM= 1071.767 TRUE= 1071.42857 ) ( 1 )
CHLORINE # 42 FACTORS=	QUANT #= 8 3 5	83 31	103 83	186 103	ANGSTROM= 1075.23 TRUE= 1075.26882 ( 1 )

## Quantum Arithmetic

CHLORINE # 43 FACTORS=	QUANT #= 2 3 5	15 7	62 11	77 31	139 139 (1)	ANGSTROM= 1079.08 TRUE= 1079.13669
CHLORINE # 44 FACTORS=	QUANT #= 2 9 23	9 37	37 83	46 83	83 (1)	ANGSTROM= 1084.667 TRUE= 1084.33735
CHLORINE # 45 FACTORS=	QUANT #= 8 3 5	28 7	115 11	143 13	258 23 43 (1)	ANGSTROM= 1085.171 TRUE= 1085.27132
CHLORINE # 46 FACTORS=	QUANT #= 8 3 5	28 7	115 11	143 13	258 23 43 (1)	ANGSTROM= 1085.304 TRUE= 1085.27132
CHLORINE # 47 FACTORS=	QUANT #= 2 3 7	21 43	86 107	107 139	193 (1)	ANGSTROM= 1088.06 TRUE= 1088.0829
CHLORINE # 48 FACTORS=	QUANT #= 2 9 13	23 23	94 47	117 139	211 (1)	ANGSTROM= 1090.271 TRUE= 1090.04739
CHLORINE # 49 FACTORS=	QUANT #= 8 3 5 49	12 11	49 61	61 61	110 (1)	ANGSTROM= 1090.982 TRUE= 1090.90909
CHLORINE # 50 FACTORS=	QUANT #= 2 3 7	13 11	53 13	66 17	119 53 (1)	ANGSTROM= 1092.437 TRUE= 1092.43698
CHLORINE # 51 FACTORS=	QUANT #= 4 3 5	15 19	61 61	76 137	137 (1)	ANGSTROM= 1094.769 TRUE= 1094.89051
CHLORINE # 52 FACTORS=	QUANT #= 4 3 5	15 19	61 61	76 137	137 (1)	ANGSTROM= 1095.148 TRUE= 1094.89051
CHLORINE # 53 FACTORS=	QUANT #= 32 81 5	16 13	65 73	81 146	146 (1)	ANGSTROM= 1095.662 TRUE= 1095.89041
CHLORINE # 54 FACTORS=	QUANT #= 32 81 5	16 13	65 73	81 146	146 (1)	ANGSTROM= 1095.797 TRUE= 1095.89041
CHLORINE # 55 FACTORS=	QUANT #= 2 3 5	17 17	69 23	86 31	155 43 (1)	ANGSTROM= 1096.81 TRUE= 1096.77419
CHLORINE # 56 FACTORS=	QUANT #= 8 9 7	18 13	73 41	91 73	164 (1)	ANGSTROM= 1097.369 TRUE= 1097.56098

# Quantum Arithmetic

## QUANTIZATION & Factoring of 80 Spectrographic Chlorine Lines

CHLORINE # 57 FACTORS=	QUANT #= 32 3 7	113 77 11	96 173 19 139	ANGSTROM= 1098.068 ( 1 )	TRUE= 1098.2659
CHLORINE # 58 FACTORS=	QUANT #= 2 3 5	21 85 7	106 191 17 53	ANGSTROM= 1099.523 ( 1 )	TRUE= 1099.47644
CHLORINE # 59 FACTORS=	QUANT #= 4 9 5	1 4 ( 1 )	5 9	ANGSTROM= 1107.528	TRUE= 1111.11111
CHLORINE # 60 FACTORS=	QUANT #= 4 9 5	9 35 7	44 79 11 139	ANGSTROM= 1139.214 ( 0 ) Faulty	TRUE= 1139.24051
CHLORINE # 61 FACTORS=	QUANT #= 4 3 5	37 140 7	177 317 37 59	ANGSTROM= 1167.148 ( 1 ) Faulty	TRUE= 1167.19243
CHLORINE # 62 FACTORS=	QUANT #= 2 3 5	23 86 13	109 195 23 43	ANGSTROM= 1179.293 ( 1 )	TRUE= 1179.48718
CHLORINE # 63 FACTORS=	QUANT #= 16 9 5	17 63 7	80 143 11 13	ANGSTROM= 1188.774 ( 1 )	TRUE= 1188.81119
CHLORINE # 64 FACTORS=	QUANT #= 2 3 25	3 11 7	14 25 11 ( 1 )	ANGSTROM= 1201.353	TRUE= 1200
CHLORINE # 65 FACTORS=	QUANT #= 8 3 5	37 120 37	157 277 139 8	ANGSTROM= 1335.726 ( 1 )	TRUE= 1335.74007
CHLORINE # 66 FACTORS=	QUANT #= 16 3 5	19 61 19	80 141 47 61	ANGSTROM= 1347.24 ( 1 )	TRUE= 1347.51773
CHLORINE # 67 FACTORS=	QUANT #= 16 3 5	5 16 7	21 37 37 ( 1 )	ANGSTROM= 1351.657	TRUE= 1351.35135
CHLORINE # 68 FACTORS=	QUANT #= 8 3 25	6 19 11	25 44 19 ( 1 )	ANGSTROM= 1363.447	TRUE= 1363.63636
CHLORINE # 69 FACTORS=	QUANT #= 2 3 7	7 22 11	29 51 17 29	ANGSTROM= 1373.116 ( 1 )	TRUE= 1372.54902
CHLORINE # 70 FACTORS=	QUANT #= 16 3 25	8 25 11	33 58 29 ( 1 )	ANGSTROM= 1379.528	TRUE= 1379.31034
CHLORINE # 71 FACTORS=	QUANT #= 8 3 5	41 127 7	168 295 41 59	ANGSTROM= 1389.693 ( 1 )	TRUE= 1389.83051
CHLORINE # 72 FACTORS=	QUANT #= 32 3 31	31 96 127	127 223 139 223	ANGSTROM= 1389.957 ( 1 ) Faulty	TRUE= 1390.13453
CHLORINE # 73 FACTORS=	QUANT #= 2 3 25	25 77 7	102 179 11 17	ANGSTROM= 1396.527 ( 1 ) Faulty	TRUE= 1396.64804
CHLORINE # 74 FACTORS=	QUANT #= 64 3 5	32 95 19	127 222 37	ANGSTROM= 1441.47 ( 1 )	TRUE= 1441.44144
CHLORINE # 75 FACTORS=	QUANT #= 4 3 5	35 97 7	132 229 11 97	ANGSTROM= 1528.569 ( 1 ) 229 Faulty	TRUE= 1528.38428
CHLORINE # 76 FACTORS=	QUANT #= 2 27 25	27 74 7	101 175 37 101	ANGSTROM= 1542.942 ( 1 )	TRUE= 1542.85714
CHLORINE # 77 FACTORS=	QUANT #= 16 3 5	24 65 7	89 154 11 13	ANGSTROM= 1558.144 ( 1 )	TRUE= 1558.44156



## Quantum Arithmetic

CHLORINE # 78	QUANT #=	36	97	133	230	ANGSTROM= 1565.05 TRUE= 1565.21739
FACTORS=	8    9    5	7	19	23	97	( 1 )
CHLORINE # 79	QUANT #=	26	57	83	140	ANGSTROM= 1857.488 TRUE= 1857.14286
FACTORS=	8    3    5	7	13	19	83	( 1 )
CHLORINE # 80	QUANT #=	1	2	3	5	ANGSTROM= 1997.37 TRUE= 2000
FACTORS=	2    3    5	( 1 )				

Corrected later

# Quantum Arithmetic

## DATA SET OF FACTORS OF 80 CHLORINE LINES (By wavelength) (page 1 of 2)

Element	Line	Angstrom	Factors	f3	f5	f7	f11+		
chlorine	#01	0559.305	2	3	5	7	17	19	23
chlorine	#02	0571.904	2	3	5	7	11	37	
chlorine	#03	0574.406	2	3	5	23	29	41	
chlorine	#04	0586.240	2	3	17				
chlorine	#05	0618.057	2	3	5	11	17	43	73
chlorine	#06	0619.982	2	3	11	43	137		
chlorine	#07	0620.298	2	3	11	43	137		
chlorine	#08	0626.735	2	3	5	7	67	89	139
chlorine	#09	0635.881	2	3	11	23	139		
chlorine	#10	0636.626	2	3	5	17	71	89	
chlorine	#11	0650.894	2	3	5	11	13	139	
chlorine	#12	0659.811	2	3	5 7	13	23	139	
chlorine	#13	0661.841	2	3	5	17	29	127	
chlorine	#14	0663.074	2	3	13	41	139		
chlorine	#15	0682.053	2	3	11	41	47		
chlorine	#16	0687.656	2	3	7	11	13	101	
chlorine	#17	0693.594	2	3	7	47	101		
chlorine	#18	0725.271	2	3	5	23	37		
chlorine	#19	0728.951	2	3	7	89	103		
chlorine	#20	0777.562	2	3	5	7	83	97	
chlorine	#21	0787.580	2	3	5	11	13	19	89
chlorine	#22	0788.740	2	3	5	19	73	139	
chlorine	#23	0793.342	2	3	5	7	17	29	
chlorine	#24	0839.297	2	3	5	11	71	131	
chlorine	#25	0839.599	2	3	5	11	71	131	
chlorine	#26	0841.410	2	3	7	29	107		
chlorine	#27	0851.691	2	3	5	29	43	139	
chlorine	#28	0888.026	2	3	7	23	37	47	59
chlorine	#29	0893.549	2	3	5	7	47	107	
chlorine	#30	0961.499	2	3	5	13	19	47	
chlorine	#31	0969.920	2	3	5	13	23	29	41
chlorine	#32	0978.284	2	3	23	83	101		
chlorine	#33	0998.372	2	3	5	11			
chlorine	#34	0998.432	2	3	5	11			
chlorine	#35	1002.346	2	3	5	11			
chlorine	#36	1013.664	2	3	5	7	19	37	139
chlorine	#37	1025.553	2	3	5	7	13	43	
chlorine	#38	1063.831	2	3	5	7	13	47	
chlorine	#39	1067.945	2	3	11	19	23	103	
chlorine	#40	1071.036	2	3	5	7	31		
chlorine	#41	1071.767	2	3	5	7	31		
chlorine	#42	1075.230	2	3	5	31	83	103	
chlorine	#43	1079.080	2	3	5	7	11	31	139
chlorine	#44	1084.667	2	3	23	37	83		
chlorine	#45	1085.171	2	3	5	7	11	13	23
chlorine	#46	1085.304	2	3	7	11	13	23	43
chlorine	#47	1088.060	2	3	7	43	107	139	
chlorine	#48	1090.271	2	3	13	23	47	139	
chlorine	#49	1090.982	2	3	5	7	11	61	

## Quantum Arithmetic

DATA SET OF FACTORS OF 80 LINES OF Chlorine (By Wavelength) Page 2 of 2

Element	Line	Angstrom	Factors	f3	f5	f7	f11+			
chlorine	#50	1092.437	2	3		7	11	13	17	53
chlorine	#51	1094.769	2	3	5	19	61	137		
chlorine	#52	1095.148	2	3	5	19	61	137		
chlorine	#53	1095.662	2	3	5	13	73			
chlorine	#54	1095.797	2	3	5	13	73			
chlorine	#55	1096.810	2	3	5	17	23	31	43	
chlorine	#56	1097.369	2	3	7	13	41	73		
chlorine	#57	1098.068	2	3	7	11	19	139		
chlorine	#58	1099.523	2	3	5	7	17	53	139	
chlorine	#59	1107.528	2	3	5					
chlorine	#60	1139.214	2	3	5	7	11	79		
chlorine	#61	1167.148	2	3	5	7	37	59	317	
chlorine	#62	1179.293	2	3	5	13	23	43	109	
chlorine	#63	1188.774	2	3	5	7	11	13	17	
chlorine	#64	1201.353	2	3	5	7	11			
chlorine	#65	1335.726	2	3	5	37	157	277		
chlorine	#66	1347.240	2	3	5	19	47	61		
chlorine	#67	1351.657	2	3	5	7	37			
chlorine	#68	1363.447	2	3	5	11	19			
chlorine	#69	1373.116	2	3	7	11	17	29		
chlorine	#70	1379.528	2	3	5	11	29			
chlorine	#71	1389.693	2	3	5	7	41	59	127	
chlorine	#72	1389.957	2	3	31	127	223			
chlorine	#73	1396.527	2	3	5	7	11	17	179	
chlorine	#74	1441.470	2	3	5	19	37	127		
chlorine	#75	1528.569	2	3	5	7	11	97	229	
chlorine	#76	1542.942	2	3	5	7	37	101		
chlorine	#77	1558.144	2	3	5	7	11	13	89	
chlorine	#78	1565.050	2	3	5	7	19	23	97	
chlorine	#79	1857.488	2	3	5	7	13	19	83	
chlorine	#80	1997.370	2	3	5					

## Quantum Arithmetic

DATA SET OF FACTORS OF 80 CHLORINE LINES (By Precedence of Factors/1 of 2)

Element	Line	Angstrom	Factors	f3	f5	f7	f11+		
I	chlorine	#39	1067.945	2	3	11	19	23	103
2	chlorine	#09	0635.881	2	3	11	23	139	
3	chlorine	#15	0682.053	2	3	11	41	47	
4	chlorine	#07	0620.298	2	3	11	43	137	
5	chlorine	#06	0619.982	2	3	11	43	137	
6	chlorine	#48	1090.271	2	3	13	23	47	139
7	chlorine	#14	0663.074	2	3	13	41	139	
8	chlorine	#04	0586.240	2	3	17			
9	chlorine	#44	1084.667	2	3	23	37	83	
10	chlorine	#32	0978.284	2	3	23	83	101	
11	chlorine	#72	1389.957	2	3	31	127	223	
12	chlorine	#50	1092.437	2	3	7	11	13	17 53
13	chlorine	#46	1085.304	2	3	7	11	13	23 43
14	chlorine	#16	0687.656	2	3	7	11	13	101
15	chlorine	#69	1373.116	2	3	7	11	17	29
16	chlorine	#57	1098.068	2	3	7	11	19	139
17	chlorine	#56	1097.369	2	3	7	13	41	73
18	chlorine	#28	0888.026	2	3	7	23	37	47 59
19	chlorine	#26	0841.410	2	3	7	29	107	
20	chlorine	#47	1088.060	2	3	7	43	107	139
21	chlorine	#17	0693.594	2	3	7	47	101	
22	chlorine	#19	0728.951	2	3	7	89	103	
23	chlorine	#80	1997.370	2	3	5			
24	chlorine	#59	1107.528	2	3	5			
25	chlorine	#33	0998.372	2	3	5	11		
26	chlorine	#35	1002.346	2	3	5	11		
27	chlorine	#34	0998.432	2	3	5	11		
28	chlorine	#11	0650.894	2	3	5	11	13	139
29	chlorine	#21	0787.580	2	3	5	11	13	19 89
30	chlorine	#05	0618.057	2	3	5	11	17	43 73
31	chlorine	#68	1363.447	2	3	5	11	19	
32	chlorine	#70	1379.528	2	3	5	11	29	
33	chlorine	#25	0839.599	2	3	5	11	71	131
34	chlorine	#24	0839.297	2	3	5	11	71	131
35	chlorine	#30	0961.499	2	3	5	13	19	47
36	chlorine	#31	0969.920	2	3	5	13	23	29 41
37	chlorine	#62	1179.293	2	3	5	13	23	43 109
38	chlorine	#53	1095.662	2	3	5	13	73	
39	chlorine	#54	1095.797	2	3	5	13	73	
40	chlorine	#55	1096.810	2	3	5	17	23	31 43
41	chlorine	#13	0661.841	2	3	5	17	29	127
42	chlorine	#10	0636.626	2	3	5	17	71	89
43	chlorine	#74	1441.470	2	3	5	19	37	127
44	chlorine	#66	1347.240	2	3	5	19	47	61
45	chlorine	#51	1094.769	2	3	5	19	61	137
46	chlorine	#52	1095.148	2	3	5	19	61	137
47	chlorine	#22	0788.740	2	3	5	19	73	139
48	chlorine	#03	0574.406	2	3	5	23	29	41
49	chlorine	#18	0725.271	2	3	5	23	37	

## Quantum Arithmetic

DATA SET OF FACTORS OF 80 LINES OF CHLORINE (By Precedence of FACTORS/ 2 of 2

	Element	Line	Angstrom	Factors	f3	f5	f7	fl+			
50	chlorine	#27	0851.691		2	3	5	29	43	139	
51	chlorine	#42	1075.230		2	3	5	31	83	103	
52	chlorine	#65	1335.726		2	3	5	37	157	277	
53	chlorine	#64	1201.353		2	3	5	7	11		
54	chlorine	#45	1085.171		2	3	5	7	11	13	23 43
55	chlorine	#77	1558.144		2	3	5	7	11	13	89
56	chlorine	#63	1188.774		2	3	5	7	11	13	17
57	chlorine	#73	1396.527		2	3	5	7	11	17	179
58	chlorine	#43	1079.080		2	3	5	7	11	31	139
59	chlorine	#02	0571.904		2	3	5	7	11	37	
60	chlorine	#49	1090.982		2	3	5	7	11	61	
61	chlorine	#60	1139.214		2	3	5	7	11	79	
62	chlorine	#75	1528.569		2	3	5	7	11	97	229
63	chlorine	#79	1857.488		2	3	5	7	13	19	83
64	chlorine	#12	0659.811		2	3	5	7	13	23	139
65	chlorine	#37	1025.553		2	3	5	7	13	43	
66	chlorine	#38	1063.831		2	3	5	7	13	47	
67	chlorine	#01	0559.305		2	3	5	7	17	19	23
68	chlorine	#23	0793.342		2	3	5	7	17	29	
69	chlorine	#58	1099.523		2	3	5	7	17	53	139
70	chlorine	#78	1565.050		2	3	5	7	19	23	97
71	chlorine	#36	1013.664		2	3	5	7	19	37	139
72	chlorine	#40	1071.036		2	3	5	7	31		
73	chlorine	#41	1071.767		2	3	5	7	31		
74	chlorine	#67	1351.657		2	3	5	7	37		
75	chlorine	#76	1542.942		2	3	5	7	37	101	
76	chlorine	#61	1167.148		2	3	5	7	37	59	317
77	chlorine	#71	1389.693		2	3	5	7	41	59	127
78	chlorine	#29	0893.549		2	3	5	7	47	107	
79	chlorine	#08	0626.735		2	3	5	7	67	89	139
80	chlorine	#20	0777.562		2	3	5	7	83	97	

# Quantum Arithmetic

COMBINED DATA SETS OF SODIUM AND CHLORINE (Page 1 of 3)

	Element Line	Angstrom	Factors	f3	f5	f7	f11	
1	Sodium #12	1404.680	2 3	11	13	17	23	
2	Sodium #20	1657.920	2 3	11	13	17	31	109
3	Sodium #05	0302.450	2 3	11	17			
4	chlorine #39	1067.945	2 3	11	19	23	103	
5	chlorine #09	0635.881	2 3	11	23	139		
6	chlorine #15	0682.053	2 3	11	41	47		
7	chlorine #07	0620.298	2 3	11	43	137		
8	chlorine #06	0619.982	2 3	11	43	137		
9	Sodium #41	1875.080	2 3	13	19			
10	Sodium #40	1873.370	2 3	13	19			
11	chlorine #48	1090.271	2 3	13	23	47	139	
12	chlorine #14	0663.074	2 3	13	41	139		
13	chlorine #04	0586.240	2 3	17				
14	Sodium #31	1833.870	2 3	17	19	53	59	
15	Sodium #23	1783.040	2 3	19	23	43	53	
16	Sodium #14	1496.010	2 3	19	73	127		
17	chlorine #44	1084.667	2 3	23	37	83		
18	chlorine #32	0978.284	2 3	23	83	101		
19	chlorine #72	1389.957	2 3	31	127	223		
20	chlorine #16	0687.656	2 3	7	11	13	101	
21	chlorine #50	1092.437	2 3	7	11	13	17	53
22	chlorine #46	1085.304	2 3	7	11	13	23	43
23	Sodium #15	1497.730	2 3	7	11	17	23	31
24	chlorine #69	1373.116	2 3	7	11	17	29	
25	Sodium #29	1808.380	2 3	7	11	17	37	47
26	chlorine #57	1098.068	2 3	7	11	19	139	
27	Sodium #16	1506.410	2 3	7	11	31	73	
28	Sodium #17	1506.910	2 3	7	11	31	73	
29	Sodium #06	0372.080	2 3	7	13			
30	Sodium #13	1495.210	2 3	7	13	41	107	
31	chlorine #56	1097.369	2 3	7	13	41	73	
32	Sodium #35	1845.020	2 3	7	19	61	103	
33	chlorine #28	0888.026	2 3	7	23	37	47	59
34	chlorine #26	0841.410	2 3	7	29	107		
35	chlorine #47	1088.060	2 3	7	43	107	139	
36	chlorine #17	0693.594	2 3	7	47	101		
37	Sodium #32	1835.220	2 3	7	79	89	109	
38	chlorine #19	0728.951	2 3	7	89	103		
39	chlorine #59	1107.528	2 3	5				
40	chlorine #80	1997.370	2 3	5				
41	Sodium #38	1853.170	2 3	5	11			
42	chlorine #34	0998.432	2 3	5	11			
43	Sodium #37	1851.190	2 3	5	11			
44	chlorine #35	1002.346	2 3	5	11			
45	chlorine #33	0998.372	2 3	5	11			
46	Sodium #36	1850.150	2 3	5	11			
47	chlorine #11	0650.894	2 3	5	11	13	139	
48	chlorine #21	0787.580	2 3	5	11	13	19	89
49	Sodium #08	1293.970	2 3	5	11	17	37	

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50	chlorine #05	0618.057	2	3	5	11	17	43	73
51	chlorine #68	1363.447	2	3	5	11	19		
52	Sodium #43	1885.09	2	3	5	11	23	29	61
53	chlorine #70	1379.528	2	3	5	11	29		
54	Sodium #25	1788.85	2	3	5	11	29	41	101

Note; Factors corrected

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## COMBINED DATA SETS OF SODIUM AND CHLORINE (Page 2 of 3)

Element	Line	Angstrom	Factors		f3	f5	f7	f11+		
55	Sodium	#04	0301.440	2	3	5	11	47	59	73
56	chlorine	#24	0839.297	2	3	5	11	71	131	
57	chlorine	#25	0839.599	2	3	5	11	71	131	
58	chlorine	#30	0961.499	2	3	5	13	19	47	
59	Sodium	#30	1821.700	2	3	5	13	19	73	101
60	chlorine	#31	0969.920	2	3	5	13	23	29	41
61	Sodium	#18	1513.100	2	3	5	13	23	41	6.9.5
62	chlorine	#62	1179.293	2	3	5	13	23	43	109
63	chlorine	#54	1095.797	2	3	5	13	73		
64	chlorine	#53	1095.662	2	3	5	13	73		
65	chlorine	#55	1096.810	2	3	5	17	23	31	43
66	Sodium	#24	1787.190	2	3	5	17	23	37	61
67	chlorine	#13	0661.841	2	3	5	17	29	127	
68	chlorine	#10	0636.626	2	3	5	17	71	89	
69	chlorine	#74	1441.470	2	3	5	19	37	127	
70	Sodium	#26	1798.410	2	3	5	19	41	139	
71	Sodium	#10	1347.540	2	3	5	19	47	61	
72	chlorine	#66	1347.240	2	3	5	19	47	61	
73	Sodium	#19	1519.630	2	3	5	19	53		
74	chlorine	#52	1095.148	2	3	5	19	61	137	
75	chlorine	#51	1094.769	2	3	5	19	61	137	
76	chlorine	#22	0788.740	2	3	5	19	73	139	
77	chlorine	#03	0574.406	2	3	5	23	29	41	
78	Sodium	#07	0376.380	2	3	5	23	31	6.3.13	
79	chlorine	#18	0725.271	2	3	5	23	37		
80	chlorine	#27	0851.691	2	3	5	29	43	139	
81	chlorine	#42	1075.230	2	3	5	31	83	103	
82	chlorine	#65	1335.726	2	3	5	37	157	277	
83	Sodium	#22	1778.240	2	3	5	37	53		
84	Sodium	#01	0300.150	2	3	5	97	103		
85	Sodium	#02	0300.200	2	3	5	97	103		
86	chlorine	#64	1201.353	2	3	5	7	11		
87	chlorine	#63	1188.774	2	3	5	7	11	13	17
88	Sodium	#11	1374.690	2	3	5	7	11	13	23
89	chlorine	#45	1085.171	2	3	5	7	11	13	23 43
90	Sodium	#44	1865.740	2	3	5	7	11	13	71
91	chlorine	#77	1558.144	2	3	5	7	11	13	89
92	chlorine	#73	1396.527	2	3	5	7	11	17	179
93	Sodium	#42	1881.910	2	3	5	7	11	17	23 271
94	Sodium	#27	1801.260	2	3	5	7	11	19	23 29
95	chlorine	#43	1079.080	2	3	5	7	11	31	139
96	chlorine	#02	0571.904	2	3	5	7	11	37	
97	chlorine	#49	1090.982	2	3	5	7	11	61	
98	chlorine	#60	1139.214	2	3	5	7	11	79	
99	chlorine	#75	1528.569	2	3	5	7	11	97	229
100	Sodium	#09	1327.74	2	3	5	7	113		
101	chlorine	#79	1857.488	2	3	5	7	13	19	83
102	chlorine	#12	0659.811	2	3	5	7	13	23	139
103	chlorine	#37	1025.553	2	3	5	7	13	43	
104	chlorine	#38	1063.831	2	3	5	7	13	47	



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105	chlorine	#01	0559.305	2	3	5	7	17	19	23
106	chlorine	#23	0793.342	2	3	5	7	17	29	
107	chlorine	#58	1099.523	2	3	5	7	17	53	139
108	Sodium	#28	1807.09	2	3	5	7	17	83	

## Quantum Arithmetic

### COMBINED DATA SETS OF SODIUM AND CHLORINE (page 3 of 3)

	Element	Line	Angstrom	Factors	f3	f5	f7	f11+		
109	Sodium	#03	0301.32	2	3	5	7	19	23	83
110	chlorine	#78	1565.050	2	3	5	7	19	23	97
111	Sodium	#34	1841.82	2	3	5	7	19	31	
112	chlorine	#36	1013.664	2	3	5	7	19	37	139
113	Sodium	#33	1837.89	2	3	5	7	29		
114	Sodium	#21	1776.57	2	3	5	7	29	197	
115	chlorine	#40	1071.036	2	3	5	7	31		
116	chlorine	#41	1071.767	2	3	5	7	31		
117	chlorine	#67	1351.657	2	3	5	7	37		
118	chlorine	#76	1542.942	2	3	5	7	37	101	
119	chlorine	#61	1167.148	2	3	5	7	37	59	317
120	chlorine	#71	1389.693	2	3	5	7	41	59	127
121	chlorine	#29	0893.549	2	3	5	7	47	107	
122	Sodium	#39	1866.45	2	3	5	7	61	89	
123	chlorine	#08	0626.735	2	3	5	7	67	89	139
124	chlorine	#20	0777.562	2	3	5	7	83	97	

# Quantum Arithmetic

## IOTA

The term "Iota" has been used in previous pages. "Iota" is a Greek word meaning next to nothingness. It is a very smallest quantity.

Iota are defined herein as the basic unit of energy. The first Iota acts as a foundation and a core of energy, on which additional Iota build themselves, or are directed to build themselves into discrete groups.

The first, or core, Iota gathers around it other Iota in groups of 2, 3, 5, and 7 Iota, making what become Harmonic cycles. It becomes larger if the "2" is in fours instead of "twos", or it can be in 8's, 16's and 9's and 27's, etc.

We can only theorize what an Iota may be. It is theorized to be a single precursor vibration, or a vibration of "one". This rate of vibration is theorized to be vibrating at a rate of four quadrillion vibrations per second. The period of such vibration is one 4-quadrillionth of a second. As they gather together in groups, the vibration rate becomes slower in accordance with the number of Iota involved.

The basic unit Iota may be considered as a spark. Surrounding two Iota is one group of 3 Iota travelling in a circular path. These planetary groups are the "sparks" for making a larger group, an aliquot part. They become a nucleus.

Surrounding this nucleus may be another group of five, Iota travelling in pentagonal formation on a circular path. To this can be added, with or without the pentagonal array, another circuit of seven Iota, again on a circular path.

The picture so painted, comes directly from a mathematical context in the very beginning of Quantum Arithmetic. The mathematical context runs,  $4^2 + 3^2 = 25$ . After negating the one core unit this becomes 24.

Following this,  $5^2 - 1^2 = 24$  and  $7^2 - 5^2 = 24$  making the magic number 24 which occurs throughout Quantum Arithmetic.

The "24" is divided into 2 parts, 3 parts and 4 parts, being 12, 8, and 6 respectively. Taking the outer rings of the Iota,  $7 + 5 = 12$ . The two inner rings are  $4 \times 3 = 12$ , and  $2 \times 3 = 6$ . This begins the Koenig Series. After this original formation of Iota, every larger quantum energy group must contain a 2, a 3 and may have a 5 and/or a 7, and will be divisible evenly by this first one of these first Iota.

It seems that energy is thusly, created continually and passes throughout the universe. If we knew how to draw this energy, we could draw it freely and without limit.

Now that may sound quite impossible, but is it? So far as our scientific status is concerned we are familiar only with energy which is stored within matter, and obtained through laws of matter. We store water in reservoirs to make electricity. We burn, wood, coal or petroleum products for energy. We use solar energy through specially composed elements into solar panels. But we have never found out where that energy comes from in the first place. It comes, mainly, from the Sun, but we know neither how it got there or how it gets here or in what form it travels. We only know it does travel and that, after it gets here, it becomes heat and light. Occasionally it will arrive as electrical static which we say is from Sun Spots. We know not of any case in which the energy arrives in non-discrete chunks. It is all quantum in its nature, and it is quantum on the basis as described above.

It was theorized that the unit vibration was at a rate of  $4 \times 10^{15}$  vibrations per second. We must assume this second to be a human invented unit of measure until it can be determined otherwise. This is not the ultimate period of vibration, per se.

It is the ultimate precursor energy vibration, which forms itself in waterfalls to aggregate in larger and larger chunks until we can recognize them. The precursor to this precursor energy unit is in the four forces, whatever they are. These forces accumulate and aggregate from  $10^{-35}$  second vibrations, much the same mathematical procedure as the energy forms in larger chunks. But this field of forces is far beyond our capability, at least until we have firmed up and confirmed this proposed theory on energy. The speed at which the forces travel is considered to be instantaneous, but it would not be. It may travel a distance of a light year in a second but in all probability it is not instantaneous.

We have considered that energy travels at the speed of light which is approximately 186,000 miles per second. This probably is not true of energy. The shorter wavelengths of energy most probably travel much faster, and the much longer wavelengths, below infra-red wavelengths, probably travel much slower. We do know that blue light travels slightly faster than red light. This variation in speeds of travel probably carries throughout the energy spectrum. In the spectrum of the forces, above energy, the rate of travel of

## Quantum Arithmetic

the forces is correspondingly much faster.

### DETAIL

The first Iota has a special facility in the mathematical aspects of formation of workable Iota. It corresponds to the hole in the center of the disks of gold in the Cattle problem, page 35, Book 1. It does not contribute to the magnitude of energy, just as the hole in the disk does not contribute to the amount of gold in each disk.

This is the answer to the question which was so often brought up in the volumes of "Pythagoras And The Quantum World". The question was, "What happens to that one missing unit at the center?" That one unit which seems to be missing is transcendental. Its whole purpose is to set in motion the rules, both mathematical and physical, for creations, for which it becomes the foundation. In engineering design, that one unit is rather inconsequential, but when one enters into quantum design, with its absolutism, this omission must be taken into consideration. It must be taken into consideration because a simple one unit change in a number, will completely change the quantization process, and the subsequent factoring.

Many Iota combine to form aliquot parts, but an aliquot part may not be greater than 10,000 Iota. This brings us to the Myriad.

### THE MYRIAD

The Myriad is equal to 10,000. It was taken by the Greek philosophers as the highest number that need be considered in any calculation. In Quantum Arithmetic this is taken to be the maximum that any calculations need be considered. In effect, that is also the limit, (5 significant figures), that most design calculations need to be carried, even in conventional mathematics.

The Greek view was much more stringent. They considered that 7 was the highest prime number that need be considered. Seven Factorial (7!) is 5040, or the product of the first seven integers,  $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$ . But Pythagoras considered going to 10 because  $7 \times 8 \times 9 \times 10$  is also 5040. So, when the Greeks reached 5040 they, also "rounded off" their calculations. But they had their reasons, as will be explained below.

NOTE: Archimedes demonstrated that the Greeks knew that numbers went on forever in his explanation of the "Sand Reconnner" to the Ruler. It also demonstrated that these numbers were meaningless for our practical purposes.

For the waves, which we are considering, the length of a wave is determined by the size and number of prime numbers involved. That length is the product of all the prime numbers included in its quantum number. One can see the complexity which arises when it involves seven prime numbers. It becomes quite limiting when one realizes that  $100 \times 100 = 10,000$ . Nature has provide a solution to this enigma.

### THE LIMIT

Two vibrations coming together will produce a much longer vibration, as their product. Suddenly we find ourselves above the 10,000 limit of the Myriad.

How is it possible to work with waves of any length without going beyond this 10,000 limit?

There are two things to consider. The first was discussed in the use of only the lower prime numbers below 100 and preferably only prime numbers well below 60. This keeps the wavelength down.

The second is a realization of the instability or "error-factor" which ordinarily occurs in our calculations. It becomes necessary to limit the number of decimal places to which we can trust our calculations. We may go to great ends, to extend to six or seven significant figures. This same thing happens in the quantum world, but in a much more predictable way.

### QUANTUM FLEXIBILITY

What has been called "quantum", is not so absolute as the reader has been lead to believe. There is a flexibility in each unit. That flexibility has permitted mankind to perform non-quantum mathematics, and nonquantum design. But it is in using this flexibility zone which has brought contemporary science its troubles, chaos, and accidents. It is precisely this flexibility which permits and promotes evolution and change in nature.

The zone of flexibility is an allowable error in striking each integer precisely. The allowance appears, (from music), to be approximately 0.0002 per unit. As values approach 5000 the cumulative error can be one unit, ( $5000 \times 0.0002 = 1$  unit). At present we can only experiment with this as we explore the Music of The Spheres. (The two ten-thousandths is only approximate as presently determined.) Every piano tuner is familiar with this same major problem in tuning a piano, to get

## Quantum Arithmetic

each octave as precise as possible. To put this in a more visible perspective it compares machining a mechanical part to a tolerance of two ten-thousandths of a centimeter for each centimeter of thickness.

### THE FIRST WATERFALL

To illustrate how the flexibility zone operates, the simplest example is given: Say that three waves are joined in harmony which have values of 3002, 3999, and 5002. They will give nearly perfect harmony because they are near the 3-4-5 ratios. But they can use the flexibility zone to readjust their actual values to true 3, 4, 5 values. This will create a cascade to the Harmonic Cycle which was pictured in the previous chapter. That is to say, they adopt a new unit of measure which is 1000:1, like our change from meters to kilometers.

Of course, between 5000 and 10,000 there will be cases where, say, not all values could revert to lower values. This dropping in scale is called a "cascading" in a "waterfall" of energy. As an additional problem, there will usually be from four to seven such waves joining in harmony. All of them may not cascade at the same exact time. If some cascade at slightly different times, this brings in the "phasing-in" features which was explained earlier.

There may be as many as seven or eight cascades, or waterfalls between the creation of the unit energy, Iota, and the period of, say, 0.1 vibration per second.

Between the wavelengths of visible light and wavelengths of sound, there appear to be two cascades. That is why we use Angstroms for measuring light, and Meters for measuring sound wavelengths. Nature does, essentially the same thing.

### ORGANIZING ENERGY

The features described above lead us to the formatting of energy. It is first, assumed, that the shortest energy cycles to be considered are at a frequency of 4 quadrillion cycles per second, or a frequency of  $10^{15}$  hertz. (This is energy. The Forces which generate the energy are much faster, possibly up to  $10^{40}$  hertz.)

The forces generate this energy at a uniform rate of 4 quadrillion hertz, and all units of energy, Iota, are presumed to be the same size. These units of energy combine in aggregates of 3, 4, 5, or 7 units, to form their basic waves. (They do not

aggregate in two's). These discrete waves can then join in various combinations to form any one of the four basic Harmonic Cycles. These form the waves which have no factor larger than 7, (except powers of 2, 3, 5, or 7), in their quantum number. This will constitute the first "waterfall" of energy.

We do not find anything to prohibit them, from also joining in larger aggregates, but they probably do not at this first waterfall. There is a possibility they could join in harmonic cycles which create waves having integers up to 10, in their quantum number. If the Harmonic Cycles having quantum numbers up to 10 can be aggregated, that would be the limit because  $7 \times 8 \times 9 \times 10 = 5040$ . In this case there could be only fifteen different Harmonic Cycles. (Check it out!).

Of these, there would be 7 female Harmonic Cycles and 7 male Harmonic Cycles, and the basic 3, 4, 5, cycle based on the unit quantum number of 1, 1, 2, 3. There would be attraction between any male and any female Harmonic Cycle. But there would be repulsion between male cycles and between female cycles. This is the beginning of Music Of The Spheres.

All of these notes are "good", but when they join into pairs most of the chords will be "good", but some of them will be "bad". We say there will be "harmony", or there will be "dischord". We understand the harmony and dis-harmony, but the "dischord" as found in Music of the Spheres" is like no other chord we have ever heard and realized, as we heard it.

One must hear Music of the Spheres played in order to appreciate the above paragraph. The (good), harmony is achieved through that "Quantum Flexibility", previously described. It produces that tremolo we hear in a singers voice. It is "good", only so long as the tremolo is moderate and under about 6 vibrations per second.

When that tremolo reaches 15 hertz it becomes nerve wracking and when it reaches 20 hertz it can be disastrous. A case in point is the roar we hear from a storm, or from the ocean. This is in a range of 12 to 15 hertz. We feel it more-so than hear it. That is the musical feature which creates the feeling of awe, even from the roar of thunder. In properly tuning a piano, the strings must be adjusted to keep the "beat" between strings, under 7 hertz, when adjusting the "thirds", or the "fifths", to complete an octave.

### OTHER WATERFALLS (in wavelength)

Part of the above discussion applies only to

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later waterfalls, after the first Harmonic Cycles are formed. As the fifteen Harmonic Cycles join in pairs and then groups they will be above the 5040 limit and reach an area of instability. The instability is brought on by, and is cured by, the allowance for "Quantum Flexibility". The wavelengths become indefinite somewhere between 5040 and 10,000 units, because they miss the mark of hitting integers as precisely as they should. This will begin to appear after about 6 octaves, and complete instability will occur in the range of 10 or 12 octaves from their starting point, from one waterfall to the next.

(At this point it is necessary to clarify, whether we are speaking in terms of wavelengths or frequencies. One is the inverse of the other.

Considering numerical values as "above" in frequency, is "below" in wavelengths, and vice versa. The "First waterfall" was described in terms of hertz, but the later ones are described in terms of wavelength.) The myriads between waterfalls with which we are most familiar is in the myriad of sound, and music. A second myriad we are also familiar with, is the myriad in which the single octave of visible light occurs. Visible light appears to be in the third or fourth octave in that myriad.

We are familiar with these two myriads, light and sound. There are possibly two myriads between them. One seems to be the myriad of matter, just above the myriad of sound. The other seems to be the myriad of organic matter, above solid matter, and below the myriad of light.

Below the myriad of sound, is still another myriad. This myriad was being described above to explain the "First Myriad". We are familiar with light and sound because we have special senses to receive them. We have not been familiar with the myriad below music because there is no special sense organ to receive it. It is called the Myriad of "Mentalism" because it seems to act in the same range as the human nervous system. It might also be called the myriad of human information, which will be discussed in Book 4.

### THE SYSTEM OF MYRIADS

The way which energy is divided into myriads can be characterized as a stream of water as it flows to the sea. The sea, in this case can be visualized as a "black hole" which absorbs all energy after it has spent its useful life. The beginning of energy is presumed to begin at some creative mechanism which manipulates the Forces until such time that it creates the fundamental units of energy.

The fundamental energy is created in uncounted units, Iota, which vibrate at one common frequency of four quadrillion vibrations per second. Without discussing, or even knowing what these vibrations are or of what they consist, they will simply be called vibrations, or Iota, and they vibrate at this uniform rate. The rate is in accordance with the origination of the quantum system and they either fit into this system of units, or they actually generate and control the quantum system. A detailed, possible explanation, can be found in: [Ben Iverson, "*The Crystal Universe*" in "Journal of Sympathetic Vibratory Physics", Delta Spectrum Research, La Junta, CO, (January 1989).]

### CRYSTAL UNIVERSE

For the benefit of the reader, a brief review of the above article, is given. The aetheric universe is theorized as consisting of a three dimensional solid of equilateral triangles which are eight units on each edge. They form into larger aggregations in the shapes of the five platonic solids of various magnitudes. (See Pg. 39 & 40, Book 2). Some may even be Penrose crystals. These triangles, large and small, can be divided into two parts by a single line from any vertice to the opposite side, and this line is measured in whole units. In the 8-unit triangle this line is 7 units and divides the opposite side into 3 units and 5 units. These four integers, 3, 5, 7, & 8, as lines represent the four Forces, which are, yet undefined.

### UNIT OF ENERGY

Each unit of energy can be depicted by any of the basic unit figures which were introduced in the elementary Book 1. They can be represented by: The 4-3-5 right triangle. The 1-5-7 segment of the Koenig Series: The 8-unit equilateral triangle: Or by any other figure generated by the quantum number 1, 1, 2, 3.

Each unit of energy is too small to ever be verified empirically within our systems of experimentation.

### AGGREGATION

These small uniform units of energy are pictured as flowing across a flat plain and gathering together in aggregates of threes, fours, fives, and sevens, and powers and products of these four primes. There will be very few which gather into larger prime numbers of aggregations. The larger primes would be considered normally as "strays" and limited to being aggregations of twenty different prime sizes. (11, 13, 17, 19, 23, 29, 31, etc.

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up to 97). Even at this size they are probably undetectable, except through mathematics. Whenever they aggregate, they can be said to plunge over a waterfall and become Harmonic Cycles, and the larger ones as Prime Cycles.

After these cycles cascade over the waterfall they have a definite wavelength. Each waterfall has the same procrustean configuration from top to bottom. The procrustean aspects apply only from the top to the bottom of a waterfall. In the plain, (The Myriad), between two waterfalls, a general plan is followed in which quantum flexibility is allowed. The physical results of the aggregating,

and decomposing, which occurs in this plain, can be extrapolated from one myriad to another, but primarily, only in the mathematical context. This is where harmonics, and Synchronous harmonics occurs. They are strictly mathematical but have predictable physical results.

BOOK 4 FOLLOWS

## NEW BEGINNINGS

### Book 4

The reader probably realizes that these three books of Quantum Arithmetic are only a beginning. Having read and understood these pages, only opens the door to far greater knowledge which must still be discovered in the time ahead. This beginning will be absolutely necessary for our future advancement. There must be major changes in our concepts and uses of mathematics as the implication of Quantum Arithmetic is realized. There may also be minor changes in the Quantum Arithmetic, as it is presented here, when it is finally adjusted to productive uses.

As Aristototle says in "*Metaphysics*":

"The study of truth is partly hard and partly easy. A proof of this is the fact that no one man is able to grasp it adequately. Yet they do not all entirely fail. Each says something about the nature of the world, and though individually he adds little or nothing to our understanding of it, still from the combination of all, something considerable is accomplished. Hence, as truth seems to be like the door, which the proverb says, no one can fail to hit, in that respect our study of it is easy. But the fact that we can have some notion of it as a whole, but not of the particular part we want, shows it is difficult. Perhaps too, the difficulty is of two kinds and its cause is not so much in the things themselves, as in us. For, as the eyes of bats are to the brightness of daylight, so is the reason in our soul to the things that by nature are clearest."

Humanity, as a whole has made the same misunderstandings over and over. Many of these have, caused us to misunderstand the important meanings which the Greeks and Egyptians, and others have tried to give us. We tend to make a great "to do" over their puzzlement over the irrationality of the diagonal of a rectangle, when in fact, there was no puzzlement on their part. The puzzlement is our own. This has blinded our eyes and our minds to the true accomplishment which they made.

The true puzzlement of the Greeks and Egyptians was not the incommensurability of the diagonal of a rectangle. Any puzzlement came from their difficulty in understanding the literature which lay before them in several ancient and foreign languages, which used words and names of things which they had not yet learned. Aristotle and others before him misunderstood those an-

cient foreign passages every bit as much as we tend to misunderstand the Greeks and Egyptians. They could not see that the Earth was not flat, or that the Sun is the center of our solar system, and that it does not travel around the Earth. When an ancient text told of something so simple as gravity there was no acceptance or comprehension of it. It really is not simple because, even today we do not know what gravity is, or what causes it.

They did make gains in transmitting to us the more ancient knowledge from those now destroyed texts, as they understood them. Now, we must winnow the wheat from the chaff. Their understanding of the ancient texts was incomplete, just as our understanding of the Greeks is incomplete.

### GAINS MADE

Aristotle says, there are small gains and there are great gains. In the years to come we will find that Quantum Arithmetic as written here, is only a small gain, although it may seem great at the present time because we must make great changes. There is so much more beyond this to be discovered, proven, and learned. Quantum Arithmetic only opens the door. It is a "door that we could not have failed to hit", eventually. We must now go through this door.

Now the door is open we can begin to see the bigger picture. All begins with energy. Energy is divided into myriads, and myriads are divided into octaves. A part of one myriad is the octave of visible light. A whole myriad is the myriad of audible sound which forms another aspect of our being and our knowledge. Many of those aspects have been entirely missed, or only hinted at by an occasional researcher.

### HUMAN SENSES

We have yet to discover what energy really is. After or before we discover what energy really is, we must learn what light is; What sound is; What harmony really is; And what life is. We must determine how they relate to energy. We have overlooked the many "invisible worlds" which are just as real as the world we recognize through our senses. They are not truly invisible. They are only invisible to our limited senses. We must accept, that we know the world which we recognize only



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because our senses are attuned to perception of that single world, or this single dimension of energy. With instrumentation we have located other worlds, or parts of other worlds, which are as real as our own. A Kirlian photograph, and a hologram are real although we cannot sense their subject matter. They are in another real dimension which is different from the one with which we are familiar.

We have adopted the vain belief that once we can give a name to an object, a thing, or an action, that we understand it. This is far from the truth. These books of Quantum Arithmetic open the door slightly. Through it we find that our science has only scratched the surface.

In many places, our science has scratched the surface, only to cloud what lies beyond, by assuming that we have discovered a final truth. We have discovered the metric system and say, this is the "final solution" to standardizing measurement. It is only a small step, and it contributes little or nothing. But as Aristotle says, "it adds little or nothing to our understanding of it, still from the combination of all, something considerable is accomplished". In this respect, the metric system has contributed to our understanding.

This has blinded many to the possibilities which nature has to offer, not only in measurement, but in all those things which we cannot sense directly. Our world, Our universe, and our lives are exceedingly small when we restrict ourselves to our senses and the additional instruments which we see fit to devise. These instruments do extend our senses, but not necessarily our understanding.

Often those instruments do not measure the critical and proper parameters, because we still must guess what the proper parameter may be. Does a thermometer measure energy? It does not. It measures heat and that is not a viable parameter. We measure wavelengths, but as shown earlier in this book, wavelength is not a primary criteria. The primary criteria is in the prime factors used in that wavelength, as described earlier in this Book 3.

### THE PATH

In the development of Quantum Arithmetic, many wrong turns were taken. A wrong interpretation or only a slight error in an to interpretation of results, has often required a retracement of steps taken. One has only to read, "Prelude to *Synchronous Harmonics*", (1976). The first entry into Synchronous Harmonics is finally written,

(1991) in the previous chapters of Book 3, and it turns out considerably different than was thought in 1976. The "Prelude" was only a prelude.

It was not that the Greeks who were thought to be dumbfounded by incommensurability. It is our humanity of today which carry that thought, and perpetuate it. The irrational numbers are not an obstacle to nature. They are a necessary part of nature. The Greeks and other ancients tend to imply this although they did not fully believe it themselves.

### ESSENCE OF CHANGE

Incommensurability is the essence of Nature. Without incommensurability there could be no change. The old writings give vague and often indirect references to this. It is not stated elsewhere in Quantum Arithmetic, but the necessity for incommensurability, in order to have change, is a conclusion to which any reader will have to eventually arrive. Again, nature has no perfect circle, and no perfectly straight line because that would forestall any further change.

Quantum Arithmetic is only a means to an end. It is not an end in itself. It will be necessary to make changes and improvements in the interpretations in many cases where the absolute proof is still missing.

The primary reason for these books is to disseminate the information for those who follow to fill in omissions; To make corrections where needed; And to continue the extension of this work.

This volume, essentially concludes this series of books in conventional application of Quantum Arithmetic. However, there will be another booklet which reaches over into the metaphysics of which Plato, Aristotle, Josephus, Lucretius and Marcus Aurelius, among many others wrote. Anyone pursuing Quantum Arithmetic must eventually enter this area in order to understand metaphysics in the common phenomena we encounter every day. In Quantum Arithmetic we find the tools for exploring into the mysteries of the mind and into biological processes. But we must first learn to apply Quantum Arithmetic to our supposedly understood features of science. Through learning how application is to be made, those applications, will make it possible to go beyond our present knowledge, and extrapolate far beyond anything we can guess.

Is there a Supreme Intelligence? There has to be. Between our intelligence and that Supreme Intelligence, there are many stages of intelligence

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greater than ours. Some beings which possess this intermediate intelligence are benevolent, and some of them may be malevolent, if they do, in reality, exist.

### ALIQOT PARTS

In the previous text were found several new bits of information and truths. Let us now try to put some of them into context to proceed to the next stage.

Aliquot parts is one of those bits. An aliquot part might be called a quantum part of a whole. In this case the whole means the whole number which is the product of the four integers of a quantum number.

Every quantum number must contain the primes 2, 3, and usually a 5 and/or a 7 for three or four of the prime factors. In addition to these four, it will usually contain one, two or three other prime factors, except in the case of 1,1,2,3. A quantum number will generally contain from five to seven prime numbers.

An aliquot part is, (technically), the product of any two prime numbers. In a quantum sense it is the product of all of the prime numbers excepting one of them. For the complete number, that aliquot part is repeated the number of times indicated by the one, odd prime number which is left out. Every aliquot part is always a composite, even number, and every composite number, which is divisible by 6, has the potential of being an aliquot part.

Every wave, or cycle of energy is made of its unique aliquot parts. It may be divided into aliquot parts, in different ways, dependent upon which prime number is left out each time. When aliquot parts are the same, it may be aligned with a second wave or cycle which has this same aliquot part. The second wave may appear to be entirely different from the first. When any two waves have the same aliquot parts they are said to be "Harmonic" to each other.

The lower the value of that aliquot part, the greater will be the harmony.

Either one of a pair of harmonic waves, when divided into aliquot parts in a different way, may align itself with a third wave which has this new form of aliquot part. Again, the first wave, also divided in still another a different way will be able to align itself with the same aliquot part in the third wave. When this occurs with the 3-way tie, they form a Harmonic Cycle. But it will be so large that

it may, (with a +2 or -2 derived from Quantum Flexibility), CASCADE TO A LOWER VALUED HARMONIC CYCLE, and a lower myriad. The scale change should be about 5040 to one.

There are three different, smallest aliquot parts. These are  $2 \times 3 \times 5 = 30$ ;  $2 \times 3 \times 7 = 42$ ; and  $2 \times 3 \times 5 \times 7 = 210$  in any scale of units.

### PRECURSOR ENERGY

The smallest scale of units is supposed to be a wavelength of one Iota. (Four quadrillion hertz, or  $4 \times 10^{15}$  hertz. This has been a tentatively assumed value for energy. To go less than this value, will put us, [theoretically], in the domain of the basic four forces, and out of the domain of energy, as such.) Theoretically, also the highest integers allowable as part of a quantum number, is somewhat less than 100. Beyond this value quantum stability is lost. The absolute highest quantum number should not produce a right triangle with any side greater than 5040. The reason this is the limit is that discrimination between units, degrades considerably in the range between 5040 and 10,000 units.

Studying this from a purely logical point, The differentiation between 999 and 1000 is much less than the differentiation between 99 and 100. This is much less, in turn, than between 9 and 10. The greatest differentiation in values is found between 1 and 2. The difference between having \$1 and \$2 is much greater than the differentiation of having a million dollars and having only \$999,999. This demonstrates the difference between strong quantization and weak or non-existent quantization. It is actually in this latter area in which contemporary science is working. It carries over, though it should not?. even when the quantum sciences are being considered.

### SECONDARY PRECURSORS

Thinking in terms of this, this frequency, how then, do we get to the frequencies of trillions of hertz? (4 trillion hertz, or  $4 \times 10^{12}$  hertz). How do we get to frequencies down in a range in which we can work? The answer is that this is accomplished entirely through aliquot parts and harmonic resonances between aliquot parts. When resonance between groups of waves occurs, then the waves themselves seem to actually become smaller aliquot parts of a new and larger scale of energy.

This change of scale seems to occur somewhere between wavelengths of 5040 to 10,000 units. These longer waves would then be measured in the low prime numbers between 1 and

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100, instead of numbers between 5040 and 10,000. They will combine in the same way that the higher scale combined and will, in turn, create their own harmonics in a myriad below the waterfall.

### AUDIBLE SCALE

After proceeding through several myriad scale changes, we eventually arrive at the scale of musical energy which is audible. That is to say, we arrive at the scale in which we have the physical apparatus, our ears, to receive and analyze these vibration.

In that analyzing we divide the myriad into octaves and redivide the octaves into audible and discernible notes. In studying the numerical arrangement of music, it is possible to determine what happens within what is assumed be one myriad of scale of energy. This myriad of scale seems to be divided into octaves and each octave then has four major notes which we obtain in playing a bugle. This gives us an idea of the generalities of how a other myriads of scale of energy may be arranged. The C, F, A, C of a bugle is an analog of red, yellow, green, blue of visible light.

### VISUAL OCTAVE

Rising from this point we go to a higher scale of energy. Other things can be discerned. In this case we go upward to the electromagnetic scale which we call visible light. Here we find we have the apparatus, our eyes, to discern and differentiate across exactly one octave of energy, from about 700 millimicron, (7000 angstroms), waves of red light to about 350 millimicrons, (3500 angstroms), of blue light. Between these we have the yellow and green which conform to the bugle notes of sound. The red, yellow, green and blue conform to the bugle notes C, F, A, C through each octave of sound.

It is from these two myriads of scale of energy, which we derive all of our basic knowledge of science and nature. On this basic knowledge we then have extended the rest of our science through instrumentation and somewhat through logic. Both of these were deficient without the firm basis which Quantum Arithmetic now provides. Much progress has been made in understanding science and nature but some magnificent errors and omissions are found to have occurred.

### SCALE OF MATTER

There seems to be one other myriad of scale of energy which we use, but have not recognized

completely. This is the scale in which we exist, -- the scale at which energy creates matter, or the illusion of matter, to us, - who are also matter.

But humans are somewhat more than just matter. We also have life, consciousness, and spirit which seem to be an entirely different myriad, or myriads of scale of energy. In searching out the myriad of scale of energy which becomes matter, perhaps we can better understand beyond that.

Matter appears to be a single myriad of scale of energy. it consists of considerably less than 100 basic elements. The radioactive elements are eliminated. The radioactive elements are in the upper range of discernment of the scale from 5050 to 10,000. That is probably the reason they are radioactive and unstable. They are in the range of weak quantum discernment. They will tend to drop to lower levels and higher quantum discernment through radioactivity, just as radium turns to lead and helium.

But where on the complete scale of energy does matter lie? Logically it seems to lie at a larger scale than that of visible light. Matter can absorb light and must therefore be a larger scale. Plants absorb light and through photosynthesis builds its volume of matter. These plants can be dried and burned to again release this energy as heat and light. So matter should reasonably lie somewhere between sound and light.

In the upper range of this scale, at the top of the scale of elemental matter, is the range of chemical combination. The elements absorb energy from the scale of electromagnetic, heat and light. This forms chemical combinations between elements which is a temporary state. Photosynthesis also lies in this range, -- Myriad of Chemism.

### SCALE LIMITS

No myriad of scale is clearly delineated but the lower bound, in the scale of matter, can be defined. This can be done through quantization of the spectrographic lines of the elements and their electron energy states. This has been carried out to a degree but is yet incomplete. (See Chemistry in Book 3.) Hydrogen and Helium are at the stable bottom of the myriad of matter, and radioactive elements are at the unstable top.

The myriad of scale of audible sound is usually delineated to begin at 32 hertz and end at approximately 7000 hertz. This is strictly sensorial judgement and may vary between individuals, as

is also the case in the octave of light, between red and blue. The lower bound of music may be as low as 25 hertz and may be as high as 60 hertz.

### MYRIAD OF MENTALISM.

Below the audible scale is another myriad of scale which is just beginning to be investigated.. This is in the approximate range of 1 hertz to 30 hertz. Humans are susceptible to this range. It might be called the mental / emotional range. This range seems to be received into our bodies directly into the nervous system through sympathetic vibration. We unconsciously receive it from the system of "beats" resulting from music. It is an example of the cascading of energy from one myriad of scale to a lower myriad.

"Beats" are said to result as the difference between musical tones, but this is a minimal definition. This difference must be a low prime fraction, (with denominator less than 16), of both tones which generate it. That is to say, the difference tone must divide both of the musical tones and must be an aliquot part of both of them.

The physical effects of the myriad of scale from 1 to 30 hertz is directly upon the nervous system. Those tones from one to about 4 hertz are relaxing tones. They are usually pleasurable and will tend to bring on sleep. From 6 to 12 hertz are tones of increasing emotional activity. From 12 to 20 hertz are tones which are generally extreme in activity and are sometimes destructive. From 20 to 30 hertz the influence is indeterminate as is usually the case at the high end of any myriad of scale.

These, 1 to 30 hertz tones, are often received unconsciously, without accompanying musical tones. They are unrecognized, but can create definite moods, not only in the individual but in general populations.

It is this which generates the awe from hearing thunder or the roar of an angry ocean. We feel these tones rather than hear them.

The other three senses taste, smell, and touch, have played only minor parts in developing our knowledge of nature. The visual sense has played the major role. This has left us with the concern about matter and things related to matter. We have learned that matter is composed of energy without understanding the much larger role played by energy.

### STANDING WAVES

Solitons, or standing waves, have no explana-

tion in today's science. It is otherwise in Quantum Arithmetic. Matter is composed entirely of solitons of energy. Electrons are male solitons. They surround the protons which are female solitons. Harmonic Cycles composed in accordance to Problem #3, in Book 1, page 8, will provide 95 different kinds of solitons. This is one Harmonic Cycle for each element of matter, although there are only about 60 different stable, (non-radio active), elements. The table of elements is further divided into octaves of male and female elements.

Being restricted very much to the myriad of scale of matter, we have termed this "Physics", and the rest of the myriad scales as "metaphysics". We have considered that physics and matter is all that really exists. Reality carries far beyond this. Quantum Arithmetic carries us into these other myriad scales.

### WHY AND WHEREFORE

#### THE ROOTS

This chapter is inserted to assist the reader in understanding and remembering a mental picture of Quantum Arithmetic.

Why are the integers in the quantum number designated as b, e, d, a? It would seem that, since they are the very beginning they should be a, b, c, d.

One must go back to 1976 at the writing of "Prelude to Synchronous Harmonics". At this time The Pythagorean right triangle was pictured as Base "A"; Altitude "B"; and Hypotenuse C. It was thought these were the primary parameters. In addition to this, the mean of the hypotenuse and the altitude was given as D, and the difference between D and the hypotenuse, or difference between D and the altitude was taken as E. In "Prelude to Synchronous Harmonics" the "E" was given as the "Order Number" in relation to D.

Much of what is written in these texts of "Quantum Arithmetic" was known at that time. But it was NOT recognized that the sum and difference of the Base and Hypotenuse, (being square numbers), completed the primary parameters. When, (1976), the ellipse and the equilateral triangles came into the picture, it was realized that a uniform system of identities was possible.

So, here was a whole system of mathematics with a garbled set of identity assignments. It was not until about 1980 that I finally decided to straighten out this mess, and reassign the letters of the alphabet. The only identities I could save

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were D, and E. But since they were secondary parameters, and their roots were the primary parameters I assigned the square roots of D and E to be "d" and "e".

It was in 1980 that d+e became a, and d-e, became b, and Fibonacci came into an already assembled picture of Quantum Arithmetic. All of the basic work had to be revised to reflect this new letter assignment.

### PAR TYPES

The importance of the four types of numbers was well known, to me, long before 1965. They were called the  $4n$ ; The  $4n+1$ ; The  $4n-1$ ; And the  $4n-2$  integers. This last, differentiated the  $4n$  integers from the  $2n$  integers. This was cumbersome to use, so a name was assigned. They were first called the 4-numbers, the 5-numbers, the 3-numbers, and the 2-numbers.

Then came another differentiation of integers based upon 3's with plus one and minus one. In addition to this, there is another number group based on a primacy of 5 and the plus, and minus to that. The pentagonal numbers came into play. These are neither described elsewhere, nor used in these texts.

So, here I was, trying to differentiate between twelve kinds of numbers. They were  $3n-1$ ,  $3n$ , and  $3n+1$ ; The  $4n-2$ ,  $4n-1$ ,  $4n$ , and  $4n+1$ ; And the  $5n-2$ ,  $5n-1$ ,  $5n$ ,  $5n+1$ , and  $5n+2$ . Every integer can be classified in three ways. It can be classified according to its relation to 3 to 4 and to 5. Within the first sixty integers, every integers will come up with a different combined classification for each. For instance, "What are the three types of classifications of number 37?". Integer 37 is  $36+1$ ,  $36+1$ , and  $35+2$ , for its classification in relation to 3, to 4 and to 5. To repeat, "what is the 3-type classification of 32?". It is  $33-1$  or  $3n-1$  for 3;. It is  $32+0$  or  $4n$  for 4. And it is  $30+2$  or  $5n+2$  for 5. I renamed them 3-tri for the  $3n$  integers, 4-quad, for the  $4n$  integers and 5-pent for the  $5n$  integers.

They became the 2-tri, 3-tri, 4-tri; The 2-quad, 3-quad, 4-quad, and 5-quad; And the 2-pent, 3-pent, 4-pent, 5-pent, 6-pent, and 7-pent integers. Although 3-tri and 5-pent, are not introduced in these books of Quantum Arithmetic, they are still necessary divisions of integers, in addition to the four number types which Euclid introduced in Euclid VII, Proposition 28.

The name "quad" did not seem to fit, so I tried to go to a different language from the Greek and Latin forms for "four". Hindustani-Urdu counts by

"Ek, Do, Teen, Char, Paunch, Chai, Sath, Augth, Nos, Dos". I selected the "Char" for "four-ness", and subsequently simplified that to "Par". It is not changed from that selection which occurred in 1980.

There is the realization that readers may have related "par" as relating to "parity", which is root intended. The evolution of "par", in this case, develops from "char".

In the mean time, the 2-tri, 3-tri, 4-tri, and the 2-pent to 7-pent, (the tri and pent), integers still stand. In the examples given above: 37 is 4-tri, 5-par, and 7-pent; 32 is 2-tri, 4-par, and 7-pent. No two integers below 60, will have the same combined classification. They will come in handy when one begins to relate Quantum Arithmetic to solids, and particularly the Platonic solids. These combined number types will be seen reflected in the Harmonic Cycle pictured in Book 3. They are also related to the harmonics of division, both in digits of the quotient and the integers of remainders. They also reflect from the sexagesimal system of the ancient base 60 of counting.

Curiously, it was 5 to 8 years before 1960 that Synchronous Harmonics was derived. And the precursor number types described above, were used to develop Synchronous Harmonics.

In 1961 a patent application was made for a computer which operated on the principles of Synchronous Harmonics. Patent Number 3,157,355 was granted November 17, 1964. For further reading, any interested parties may obtain those patent papers. Construction of a working model was started after the preliminary model, but never completed. It was found that quantum Arithmetic could be handled in the standard binary computer, when BASIC language, and time-sharing were developed. Program "Quantize" was developed in 1977, with the old identities.

### KOENIG SERIES

To understand the Koenig series may be a problem for many. One starts with a square which is 7-units on a side. In a clockwise or counter clockwise direction, a point is located 3-units from each corner. These points are then joined around the square, creating a square inside the original square. This inner square is 5-units on a side, and the cut off areas will all be 4, 3, 5, prime triangles.

Matching the 5-unit sides to new triangles, to complete a rectangle, construct four more triangles. This will leave a one-unit square at the cen-

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ter. One may start with a larger square which is 17-units on a side and mark off points which are 5-units from the corners. The 13-unit square will fit precisely into this with 12, 5, 13 triangles cut off from the corners. A second set of 12, 5, 17 constructed inside these make a 7-unit square at the center.

Or one may start with a square which is 23 units on a side and take out 8, 15, 17 triangles, again leaving a 7-unit square at the center.

This is a two way split in the Koenig series. But there is generally a 7 way split at each of these outer squares. So there is a choice of five additional sizes for the secondary outer square which leaves a 7-unit square at the center.

### OTHER TEXTS

The information in these texts of "Quantum Arithmetic", is the same as information to be found in the three volumes of "Pythagoras And The Quantum World", (1982-1986). The difference is that "Pythagoras And The Quantum World", and the booklet, "Prelude to Synchronous Harmonics", (1976), are written in the order in which information was firmed up with solid proofs. Although Synchronous Harmonics was known at an early date, it could not be explained until much of the rest of Quantum Arithmetic was in place.

All proofs will appear in the volumes of "Pythagoras And The Quantum World". They are not given in "Quantum Arithmetic" because the means of proof will often be quite obvious after the text material is understood. The object of "Quantum Arithmetic" is to highlight the relationships within prime numbers, and then to relate them to our physical world. To have given the proofs here would have cluttered the book, and destroyed the continuity of it. Since this is considered as a text book, it is carried through, much as current mathematics is taught.

In all these respects, it is understood that these volumes of "Quantum Arithmetic" are dense and compact, but continuous.

They will need expanding, by those who are adept at teaching the different stages in the evolution of teaching. The first paragraph on page 56 of Book 2 of Quantum Arithmetic is meant to facilitate the necessary expansion of the text material.

Because these books are dense, a reader may go through them rapidly, but it may take as much as five years to glean sufficient information from them to fully understand Quantum Arithmetic, in

its present state of development. However, before that time, an interested reader will become sidetracked on a given point and begin to explore in directions which are not described in these texts.

There are so many outreaching arrows in the material, which point to all areas of science and nature, that they were impossible to include. Many of them have been explored, but are not described in the text, except by an occasional hint at where they seemed to be pointing. The Cattle Problem on page 35 of Book 1, is one of these hints. The chapter on "chemistry" in Book 3, carries the hint one step further.

Every nook and cranny of science and nature is reached through Quantum Arithmetic. it covers all of the valid current schisms of science, confirming most, but invalidating others. But Quantum Arithmetic adds other possibilities. One of these is the possibility of dividing geology into disciplines of Seismic Geology, Vulcan Geology, Hydro Geology, and Aeolian Geology. These would apply the four categories which the Greeks called, Earth, Fire, Water and Air to geological formations.

Sixteen lettered identities have been assigned to cover all basic calculations in Quantum Arithmetic. They are permanent assignments. The user will find occasion to need other variables, but these sixteen should remain unchanged.

In the previous texts, the sixteen identities which relate to specific geometric measurements, have definite interrelationships between them. These were assigned to relate the triangles, circles, ellipses, etc. in a numerical way. The mathematical relationships between these identities and their combinations was described. The basic mathematical requirements and results were also discussed, including the requirements proscribed by the prime numbers.

Quantum Arithmetic is not in any sense, an invented mathematics. It is entirely natural. Much of it is derived from a better understanding of ancient mathematics of more than two millennia ago. There is probably much more to be gained by additional study of ancient texts, and particularly the work of Diophantus of Alexandria, and Euclid's Geometry.

### PARAMETERS

So long as the relationship is mathematical, these relationships become absolute truths. But when these truths are called upon to apply to the empirical sciences there can be many variants of

## Quantum Arithmetic

the application.

The applications derive from the conventional parameters used in the physical sciences. But where did these empirical parameters come from? Many of the parameters used in empirical science may not be fully derived. For example: The Fibonacci numbers are used in some cases, but not as the quantum numbers, as they are in Quantum Arithmetic, which they certainly are.

In musical chords, we have the halves, (or octaves), the thirds, the fifths, and the sevenths, but the specific note combinations are not those fractions. The major thirds is given as a ratio of 5:4. The major fifth is a ratio of 3:2; And the major seventh is a ratio of 15:8.

### PROGRESS

The correct natural parameters must be developed throughout science. Music is one of the major starting points. Quantizing, prime numbers, and understanding Synchronous Harmonics is all a part of this.

Parameters which are accepted in relation to matter may be lacking in completeness. Some of them in connection with energy probably are more accurate. For instance, temperature is not a measurement of energy. Wattage is a measurement but it is an incomplete parameter. It is hoped they can be developed with the help of, and in line with, Quantum Arithmetic.

In the previous texts, the value of  $d/e$  was developed in connection with the Quantum points, (Q-points). They seem to lead us to an acceptable parameter. It happens that  $d/e$  relates to the ellipticity of an ellipse. It is the inverse of the conventional definition of ellipticity, which is  $e/d$ . In the quantization process of Program Quantize, the value  $e/d$  was used to develop the quantum numbers from available empirical measurements. As  $d/e$  is the distance along the major diameter of an ellipse between Quantum points of that ellipse. This feature allowed us to find relativity between true quantum numbers, but possibly not the ultimate and absolute quantum numbers individually. There is a true and natural unit of measure, but this has not been found. The quantum numbers seem to lead us to other natural parameters.

None of the four integers of a quantum number, should be greater than 100. To go beyond that leads to instability and chaos. This instability was discussed in previous chapters, along with the myriad, (10,000 units). Also discussed was, what happens after number values pass through

this instability and suddenly regain a new stability?

The sixteen assigned identities are not variants because these lead to a workable system. But there remains a number of possible variables which may, or may not, come into play. Only when the entire plan is put into place and confirmed in empirical research, will true and faithful parameters be able to fill these identities.

Another feature to be described is the phenomena of harmonics between two frequencies. This has been proven mathematically, and pictorially. It was discussed in a previous chapter. It has been tested empirically, and been found to apply as described, but that may not be a complete interpretation.

Putting this to actual use will be the final test. Any given interpretation cannot be valid until it has been checked by independent means, and then applied to physical realities in all its variant forms.

The mathematical content stands on its own support, and provides the needed support for future practical applications. The future practical application will provide the proof of the mathematical organization. In these applications, then, much of what is now scientific theory, can be put on the firmer foundation of Quantum Arithmetic. Some of those theories will become practical, scientific law.

It is astounding that such a mathematics could be discovered at this late date. Probably even more astounding is the fact that we have made the scientific progress which has been accomplished without this very necessary mathematics. Science has long theorized a presumed Grand Unified Field. By application of Quantum Arithmetic to physical conditions, there is little doubt that this is the basis of that Grand Unified Field.

Quantum Arithmetic is needed, and it is needed now. Science cannot be permitted to run rampant. It is working blind and in chaos without Quantum Arithmetic. A few scientists have used Quantum Arithmetic to remove the foggy of contemporary science. These few are creating amazing wonders which would be impossible, otherwise.

The recently formed International Keely Society is in the forefront of this research.

### ENERGY IS INFORMATION

## Quantum Arithmetic

Each specific frequency of energy is a specific bit, or byte, of information. Each quantum frequency within a given span of each myriad of energy has a bit of information connected with it.

We can see this in chemistry. In any simple two-element compound, each of those elements must be in a specific quantum state in order to bind together. That is to say, the energy information between the two elements will correspond. The frequencies will correspond. They may not be the same but they will be harmonics of each other to the extent that the information within each element's frequencies will form cohesive information through its aliquot parts.

The ancients also utilized this feature in linguistics. Four different societies used alphabets in which the letters corresponded to numerical values. These were Sanskrit, Aramaic, Hebrew, and Greek. It is possible that the Inca quippas also carried messages in alpha-numeric relationships. We have lost, or should consider that we have lost the coding for this relationship between letters and numbers. However, it does tell us that numerical energy is specific information, according to its frequency.

The information in a given frequency depends on which myriad of scale that a specific frequency occurs. If it is the myriad of matter, this information pertains to the formative energy in matter. If it appears in the myriad scale of audible sound it pertains to a note of music. If it is in the myriad which contains the octave of visible light it pertains to a specific color.

### PARAMETERS

The specific frequency may have the same numerical value in all of these myriad scales, but our perception is that the message is different in each case. Is it really different? Or have we not used the proper parameters in classifying the information?

It has been commonly accepted that the temperature of any thing, is some measure of its energy. It is a measure of heat, but heat pertains to the two octaves of energy below the octave of visible light. In measuring temperature it appears that we are measuring something other than energy frequencies. We should be measuring the frequency and designate the myriad of scale to which that frequency applies.

From ancient mathematical approaches, each myriad of scale, stepping downward, increases by approximately 5000 fold. We can assume this

multiple is very precisely fixed. If that is so, it is findable.

Then beyond this we should find out whether it is actually the frequency which should be measured. Perhaps it is only an aliquot part of a frequency which applies. With that consideration, it would seem that the photon is an aliquot part in the first myriad scale.

So much for temperature. Next, what about the way we measure mass? Mass, of course applies only to the myriad scale of matter. This is where  $e = mc^2$  comes in. It will give us a lead as to where the proper parameters lie, in order to derive parameters for measuring energy such that they will be compatible with all myriad scales.

### THE MESSAGE

In the letters of the alphabet, we expect the message to be in the alphabet. Messages are formed: in the myriad scale of audible sound; in the myriad of our emotions; in the octave of the myriad of light. These myriad scales have been shown to involve specific frequencies in which we can measure cause and effect. These may not be sufficient to work out analogs for determination of proper quantum parameters.

In audible sound, we can project from the myriad scale above audible sound, (ultra sound), to produce a specific frequency in audible sound. This appears to be the only area in which we can presently control, and know we are controlling, the cascade of one myriad scale to a lower myriad. But if we take all of science and consider the proper parameters, perhaps we can discover other points of cascading and combinations of frequencies to produce the cascading correctly.

### SENSORY INPUT

Energy is information which we can glean directly through our sense of sight. Each cone and rod in the retina becomes a pixel of information. The cones seem adapted to color discrimination, which is frequency discrimination. The rods seem designed only to discriminate whether there is energy and how much amplitude it carries. The cones predominate near the center of the retina. The rods predominate away from that center. Color vision is therefore sharpest at the center of vision, and there is very little color discrimination at the periphery.

Energy is also information which we can obtain directly through our sense of hearing. Each hair or fiber in the cochlea of the ear is attuned to obtaining certain frequencies, or more possibly



## Quantum Arithmetic

the aliquot parts of a frequency, from which we derive a judgement of harmony and harmonics. The aliquot parts designate the difference between a wood wind, a string and a horn, which produce the same frequencies but different wave configurations. The ear discriminates to that extent. Unlike our eyes, our ears discriminate over a much wider range. The eyes cover only one octave. The sense of hearing covers enough octaves to be a myriad of energy.

The sense of touch appears to stretch over several myriads of energy. It covers heat sensation, which is in the two octaves below light. It covers vibratory sensation which is in the myriad of sound, and in the myriad below that. It covers the sensation of pain which appears to be a much higher myriad.

In this analysis, then, what areas or myriads do the sense of taste and smell occupy? It has been theorized that smell is a fitting physical shapes, into a cavity to which they conform. Could it not be that it is, indeed, a vibratory discrimination that is being sensed?

### INFORMATION

There can be little doubt that energy is information. The information seems to come from: Its wavelengths; From the aliquot parts of each wavelength; From an ability to correlate between wavelengths; And between aliquot parts. Amplitude of energy seems not to carry the information of the message. It carries only the urgency of the message.

Energy also carries messages outside our sensory capability. There are messages which pass between different atoms and molecules of matter. This creates the forming and the unforming of chemical compounds, and forming the shapes of matter. Each prime factor of an energy is a bit. Each aliquot part and/or wavelength is a byte of information.

Music Of The Spheres originated long before Pythagoras. "Music of the Spheres", or "Song Celestial" is the subject of Archimedes problem "The Cattle Of Thrinacia". In Odyssey of Ulysses they are called "Cattle Of The Sun".

Quantum Arithmetic dictates that the solution consists of eight integers, all below the value of 5,000. The values of the "male" notes are already known integers. The remaining "female" notes will be within 0.0002 per unit of a number which is an aliquot part.

Given those parameters, a solution is impossi-

ble to derive with conventional mathematics. It is not impossible with Quantum Arithmetic, but it will be difficult until the full knowledge of this system of mathematics is better understood.

The four "male" notes are 891, 1580, 1602, and 2226. But the first note must be doubled, (raised an octave), to 1782, making them 1580, 1602, 1782, and 2226.

(Notice that these are all factorable by 2, 3, 5 & 7, along with one larger prime number between 7 and 89. This is in line with all of Quantum Arithmetic, and indeed, with the chemistry, and astronomy which were demonstrated previously.)

Factors of these four notes are:

$1580 = 2^2, 5 \text{ \& } 79$ ;  $1602 = 2, 3^2 \text{ \& } 89$ ;  $1782 = 2, 3^4 \text{ \& } 11$ ;  $2226 = 2, 3, 7 \text{ \& } 53$

The female notes used were 754.95383, 1050.7297, 1197.965, and 1547.4254. As  $756 = 2^2 \times 3^3 \times 7$ ;  $1050 = 2 \times 3 \times 5^2 \times 7$ ;  $1197 = 3^2 \times 7 \times 19$ ;  $1548 = 2^2 \times 3^2 \times 43$ . The discrepancy between the decimal value, and the factored integer is within the "Flexibility factor" which is described in Book 3. The primary basis of harmony lies in the numbers 2, 3, 5, and 7, and three or fewer larger primes, as factors. These integer values for the female notes all factor within the primes 2, 3, 5 & 7, and one larger prime. That is the basis for their inclusion in Music of the spheres.

The values which are given are presumed to be wavelengths. All of the female notes are higher pitched than the male notes. The notes have been given the names: Tui, Li, Sun, Kun, Ken, Kan, Chien, & Chen, in decreasing pitch value. These names are taken from the Book Of Permutations, (I-Ching). In I Ching, Tui, the youngest daughter, represents Lake, or Joyful, and wavelength 756. Li, the second daughter, represents Fire, or Clinging, at 1050. SUN represents Wind, or Gentle for the eldest daughter, and wavelength of 1197. Kun, the Mother, represents Earth, or responsive Mother, at 1548. These are the four females, but Sun and Tui may possibly be reversed. This order is just a guess. The sons do certainly occur in order of their birth. The youngest, Ken represents Mountain, or Immovable, at a value of 1580. The second son, Kan represents Water, or Dangerous, at 1602. The next is the Father, or the Yellow Bull according to Archimedes. At wavelength of 1782, He represents Heaven, or Activity. This is the primary keynote of Music Of The Spheres. Finally is the eldest son,

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Chen, at a wavelength of 2226 units. Chen represents Thunder, or Arousing and perfectly corresponds with this lowest note. These names for the notes are taken from I-Ching, but their values are taken from Archimedes Cattle Problem.

While Chien is the primary keynote, each of the others is a secondary keynote in one of the lesser keys. To each of these eight keynotes will be added a fractional part of itself. The fractional parts will be  $\frac{1}{7}$ ,  $\frac{2}{7}$ ,  $\frac{3}{7}$ ,  $\frac{4}{7}$ ,  $\frac{5}{7}$ ,  $\frac{6}{7}$ ,  $\frac{7}{7}$ ,  $\frac{1}{6}$ ,  $\frac{2}{6}$ ,  $\frac{3}{6}$ ,  $\frac{4}{6}$ ,  $\frac{5}{6}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{3}{5}$ ,  $\frac{4}{5}$ ,  $\frac{1}{4}$  &  $\frac{3}{4}$ . The addition of the  $\frac{7}{7}$  is, of course the octave for each keynote. This will make 144 notes. The normal playing range will be approximately 4 octaves or 30 to 40 notes chosen for the particular musical scale desired.

All 144 notes can be used, and every note will harmonize, or be somewhat enharmonic, with every other note except those immediately adjacent to it. Some of them will be so close together that only a trained ear can discriminate between them. This gives us an idea of how some of the various modes such as Lydian, Ionian, and others, came into being. Each mode has a different emotional impact.

A prominent characteristic of these sets of notes is the vibrato which occurs between them, as a function of the 2, 3, 5, 7 prime factors of each note. This vibrato carries an intense emotional message, and should not be used carelessly.

### PLATONIC SOLIDS

All of the previous research has focused on Quantum Arithmetic in the linear and plane dimensions. It will be possible to enter into the dimension of solids, and determine how they are related mathematically.

The primes 2, 3, and 5 play a prominent part in the formation of the Platonic solids. Note first, that these solids have faces which have three, four, or five edges. There are three which have equilateral triangles. These are the tetrahedron, the octahedron, and the Icosahedron. Between these lie the cube with its square faces and the dodecahedron with its pentagonal faces.

The number of edges on any platonic solid is equal to the number of edges per face multiplied by half the number of faces. It may even be an indication of how wavelengths of energy can make standing waves which are substantial enough to constitute matter, and particularly crystalline matter.

The pentagon is prepared to reveal much to

us. It is tied closely to the Golden Ratio, and of course the pentagonal shapes are the basis of the Penrose tilings made of darts and kites. Some very special metallic compounds have also been found, which crystallizes into this pentagonal configuration.

Each of these Platonic solids can be inset in any other, given the proper dimensions. All five can be inset, one within another. That has been done.

### ENDING

These are the major developments of Quantum Arithmetic and its DYNAMIC process, Synchronous Harmonics, in hand. To have read these books and worked the given problems, still does not enlighten one in the immensity of changes, yet to be made in order to incorporate these into our daily operations. Many of the errors in our present concepts have been found and demonstrated. These errors, and omissions must be corrected before serious progress can be made.

This is a process which must be accomplished over a period of time, and that period of time, may be many years in coming. But in the application of the information in these pages to daily problems, it will be found that the road is made easier to travel.

### CONCLUSIONS

Every scientist considers mathematics a solid, unchanging science. But a new arithmetic has been found which changes all that. Those who ignore it will be left behind.

This new math is not just a re-hash of mathematics. It is entirely new, from the foundation up. It is mostly a recovery of mathematics which was practiced thousands of years ago. It is entirely new to us, but was familiar to the Greek, Egyptian, Arabic, and Oriental philosophers.

### DIFFERENT

What can we do with it? And how is it different? It is different because it ties in precisely with quantum sciences, and "quantum" means only "measurement in only whole numbers." It is different from conventional mathematics in that it is absolutely accurate, and it uses only multiplication, and addition of numbers. But with this reduced agenda it is possible to do things which conventional mathematics, with trigonometry and calculus, finds impossible.

# Quantum Arithmetic

## USES

One of the most important things it can do is to find the natural quantum number for anything for which sufficiently accurate empirical measurements are available. For example, the quantum number for Earth is "60". Then as the Greeks once did, we add an integer, and subtract the same integer from it, for the other two integers of the quantum number. This gives us a list of four numbers, including the integer which was added and subtracted. In this case, the integer is "1". it results in 59, 1, 60 & 61 for a Fibonacci configuration for Earth.

Once these four numbers are obtained, one can calculate any relationship between Earth and the Sun, ignoring the effects of any other planet, or even the Moon. This latter is important because the Moon throws the Earth 3000 miles out of its orbit twice every month. At Full Moon we are 3000 miles inside our natural orbit and at New Moon we are 3000 miles outside.

The Greeks knew about Fibonacci numbers more than 1500 years before Fibonacci was born. Euclid described them in Book VII, Proposition 28, in our present geometry books. Even the Chaldeans knew. Fibonacci had only a part of the story behind these very important number groups.

With this new math, we can outline nearly all of the paths within, and along which, an atom can travel. In an atom of chlorine there are at least eighty such paths, and Quantum Arithmetic can describe them all. It does this by taking the lines of a spectrograph and finding the precise ellipse, which represents that wavelength of light.

The same thing was done with sodium which has more than 40 paths. It was found that certain paths for a sodium electron was very similar (harmonic), to a path for an electron in the chlorine atom. It could be thought that an electron from either atom could follow both paths, and thus, tie sodium and chlorine together to make salt.

These so called, "Fibonacci" numbers can do all that. Laboratory proofs will eventually vindicate Quantum Arithmetic. In the meantime we can go on and: Do chemistry mathematically; Design more perfect musical tones and scales; Better understand the cosmos; And perhaps discover a new source of energy, as well as find more efficient applications in all science and technology. Quantum Arithmetic is here to stay. It will take time to adapt to it and make the modifications which will be required in the basics described in these

books.

## WHERE HAVE WE BEEN

Text book number One described the beginnings of this; precise mathematics. Book number 2 carried that on and began to expand on its possible application. These Books (3 & 4), begin to expand on possible application of this mathematics and its relationships to new and more empirical utilization.

Quantum Arithmetic brings in and, from its different perspective, takes a new look at such old things as prime Pythagorean triangles; Pythagorean triples which apply to equilateral triangles, Babylonian unit fractions; Truncated pyramids; A special kind of ellipse; Equal area quantum circles called Koenig Series; and ties them all together. It also brings in new things to all quantum sciences, music; DNA; and Penrose crystals.

## NEXT

The eventual following book will leave mathematics, and enter the areas which are completely beyond our sensory abilities. it will be based on these four, but will contain no mathematics. it will enter the area of philosophy, as derived from mathematical relationships. The Greek mathematicians also used mathematics to develop their philosophy, and they are called Philosophers for that reason.

There is something called Number Theory in conventional math, but Quantum Arithmetic does away with much of that. All of its features tie together and makes Mathematical Law out of what is correct in Number Theory. This Law, or these Laws are correct, and proven. (See three volumes of "*Pythagoras and the Quantum World*"). These Laws go a long way into discarding many things which are incomplete or wrong in mathematics and in science.

## NEW FOUNDATIONS FOR THEORY

As described above, Fibonacci's description of his numbers was incomplete. A better description of them is in Euclid. But even Sir Thomas Heath had shortcomings in his commentary on Euclid, about things he did not understand. We can go on further with Lord Rayleigh in his origins of wave theory. All of these things are either partly wrong, or are certainly incomplete.

Quantum Arithmetic is a phenomena. It is surprising that it was not discovered by our civilization two centuries ago. But somewhere

# Quantum Arithmetic

along the line, science decided it was on the right track. It refused to go back and review its foundations. By going back and reviewing those foundations, Quantum Arithmetic was born.

It was born by considering all of those things which were "too trivial to bother with". One, previously discarded triviality, stacked upon another eventually found a veritable flood of misinformation. Each triviality by itself is insignificant. There is really no new knowledge in Quantum Arithmetic. The only change is the difference in orientation, or a difference in the point of view in which the numbers are taken in their relation to each other, and to nature.

## DISREMEMBERING

The only difficulty a person will have in comprehending Quantum Arithmetic is their difficulty in changing from, a wrong point of view ingrained in us, to the orientation which has been outlined in these texts. Once a person adopts this changed position of viewing nature, everything falls into place and we find out how wrong we were:

(1) Science has made an error of 3000 miles in the average distance from Earth/Moon orbit to the Sun. Quantum Arithmetic can calculate that down to the nearest tenth of a mile.

(2) Science has developed many disciplines within itself. Quantum Arithmetic tells us that it is possible to extrapolate from any discipline to any other. If the first discipline is fully understood, then all science becomes one.

(3) Science has invented rigid units of measure with the thought that they would apply to nature. They do not. Nature has its own rigidly established units of measure, and until we discover one of them we will not know any of them.

(4) Science has no idea of where the Moon is, with any exactitude. The Moon appears to be on a double elliptical orbit, (a torus-like lissajou). One ellipse is in relation to its distance from Earth and one is at approximate right angles to that. With study, Quantum Arithmetic can derive that answer, but it needs more accurate empirical data from empirical science.

(5) Our civilization is running out of energy, and is beginning to pollute the Earth with the energy it has. But science does not know what energy or vibration is, in its basic definition. The picture of an atom is due for a drastic change. Quantum Arithmetic can begin to pick out the errors in current energy theory, and will eventually come up with a

better understanding, and probably, new sustainable energy sources.

## USE OF THESE BOOKS

These books are designed to get the basic information on Quantum Arithmetic, across to those who will want to use it. It will be necessary to expand, and adapt the material, for school instruction, to accommodate specific class needs. That opportunity is offered to anyone willing to accept that challenge. Free use of this material is permitted for non profit utilization. The author does not intend to profit from this material, even though nearly 50 years, and thirty thousand dollars, has gone into its development. (Recovery of those costs is a consideration.)

## REBUILDING THE FUTURE

The material given in these books is so basic, and so radically different, that it will cause consternation to a contemporary Ph.D., and in scientific and educational institutions. It eradicates many of our beloved concepts, but it does not invalidate that knowledge which is accurate. The orientation is changed. This change in orientation, and elimination of previous errors, will allow science and education to progress beyond anything which we have ever considered as a goal.

In the development of Quantum Arithmetic, there have been many wrong paths and sidetracks, which had to be retraced. Many errors in progress were made and some of those errors may remain in the material as given. In the interest of getting this information out, some features have been glossed over by eliminating smaller detail.

## PREVIOUS BOOKS

Some of these details are given in three volumes of "*Pythagoras and the Quantum World*" (1982-1986), telling of the development of Quantum Arithmetic as it actually occurred. All required proofs are given in detail in those volumes.

I conclude here, to expand on the "Cattle Problem" puzzle (Pg. 35, of Book 1) of these textbooks. When readers are able to solve this problem, they will begin to have an understanding of Quantum Arithmetic. The language of the problem is precise. The parameters given in the problem are precise. There is enough information in Books 1 & 2 to solve it, but the reader will

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have to do certain suggested text problems, in full, to gain the required understanding. It is a real problem and the reward offer will stand until the answer is released. The answer is in integers and the one to solve it will find it so utterly simple that he or she will marvel at its simplicity. It gives the solver every opportunity to err by trying to incorporate errors from conventional mathematics, which they were taught. This problem was first published in 1982 under the title, "Plato's Disks of Gold". It displays how numbers, and particularly prime numbers, fit together to create the world about us in atoms and even galaxies.

### SUGGESTIONS

To better understand Quantum Arithmetic, one must work with it and concentrate on results. It is profitable in convincing one's own mind that Quantum Arithmetic is real, and that some of the present concepts fall short of reality. Only 40 hours of such work, done in short segments of one to four hour stretches, will ingrain it in the memory.

Suggested work is:

- (1) Work out a list, of 1000 or more, (prime, [b, e, d, a]) quantum numbers, with all integers below 97. See Book 1, Page 8.
- (2) Use all of these quantum numbers to project: Prime Pythagorean triangles; Quantum ellipses; into Koenig Series; Into quantum equilateral triangles, etc. (Bk. 1, Pg. 40)
- (3) Learn to project and extend quantum numbers into (b, e, d, (a), e, d, a) Use these to project extensions of the above for relations between each figure in pairs. (Bk 1, Pg. 27)

These results should be written up for further study and future reference and placed

## GLOSSARY

**ANCIENT:** Artifacts from times preceding Greek history. Older than 2,700 years, and considered legendary.

**ENERGY:** Undefined in this text, supposedly created by concerted action by the "forces".

**FLATLANDER:** Reference to the Book "Flatland", describing life in two dimensions.

**FORCES:** Theorized to be four in number, and each having a positive and negative influence. Each force has a given obligation for the creation of its part of an Iota. Forces also control the aggregation and flow of energy. Three of the forces work at right angles to each other and may be depicted as latitude, longitude and radial on a sphere. Three forces are tentatively identified as electric, magnetic, gravity, respectively. There is a fourth force which may be spiritual.

**IOTA:** 'The smallest part possible, It is the original Greek consideration of a point on a line. In this text it is assumed to be a wavelength of a 4-quadrillion hertz vibration.

**LIBRARY OF ALEXANDRIA:** The library established by Alexander, "The Great", in Alexandria Egypt, after 329 B.C. (Destroyed 50 B.C. to 640 A.D.). it was a collection of approximately one million ancient writings into one place for reference.

**MYRIAD:** From the Greek terms for ten thousand. Used to segment the energy spectrum in groups of seven to twelve octaves, with sameness, but differences between myriads.

**OCTAVE:** The span of numbers from any integer to the double of that integer.

**PAR-VALUE:** Classification of all integers in relation to the nearest  $4n$  integer. They are the 2-par, ( $4n+2$ , or even-odd); The 3-par, ( $4n+3$ , or odd-even), the 4-par, ( $4n$ , or even-even); and the 5-par, ( $4n+1$ ) or odd-odd) integers. It comes from "char", Hindustani for "four". Even-even, even-odd, odd-even, & odd-odd, are Euclid's terminology, Book VII. Par is root parity exception the consideration

that it is a double-parity classification.

**PROOF:** Proof is used in its mathematical concept. Empirical "proof" is only corroborative evidence that interpretations for application are correct.

**QUANTIZE:** A mathematical procedure for determining the prime ratio between any two numerical Values. it is necessarily a computer procedure. (See Book #2, page 19).

**QUANTUM:** Composed of, or dependent upon, whole integers only.

**QUANTUM FIGURE:** Any geometric figure for which the measurements of its elliptical equivalent will have a square integer for the mean of the perigee and apogee.

**QUANTUM NUMBER:** a series of four integers, such that the first added to the second equals the third, and the second added to the third equals the fourth. They are given in the text, as b, e, d, & a. (See Euclid VII, Prop.28)

**TREMOLO:** A slower vibration, of 0.2 hertz to 30 hertz, imposed on a higher pitched tone. Also called reverberation, or vibrato.

**TRIVIALITY:** Various features and relationships in mathematics which conventional mathematics has considered inconsequential.

**VIBRATION:** Undefined in this text, except as a pulsation of energy, created by the "forces".

**WAVE PACKET:** Periodic points in a composite wave where the composite reaches a maximum, positive or negative value, or where the composite is a periodic null value.