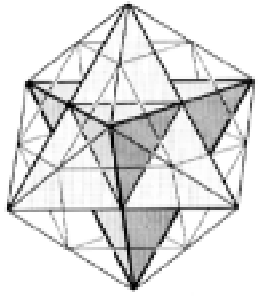

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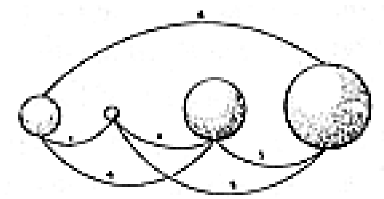
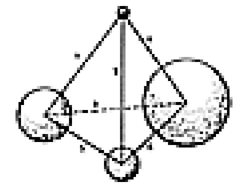




1200.00 **NUMEROLOGY**

1210.00 **Numerology**

Historically long perspective
Suggests it as possible
That many of the intriguing
Yet ineffable experiences
Which humanity thus far
Has been unable to explain,
And, therefore, treats with only superstitiously,
May embrace phenomena
Which in due course
Could turn out to be complexes
Of physically demonstrable realities
Which might even manifest
Generalized principles of Universe.

For this and similar reasons
I have paid a lot of attention
To ancient *numerology,*
Thinking that it might contain
Important bases for further understanding
Of the properties of mathematics
And of the intertransformative
Structurings and destructurings
Of the cosmic scenario yclept
"Eternally self-regenerative Universe."

My intuition does not find it illogical
That humanity has developed and retained
The demisciences of
Astrology and *numerology*—
Demi because they are
Only partially fortified by experimental proofs—
Which nonetheless challenge us tantalizingly
To further explorations
Within which it may be discovered
That generalized scientific laws
Are, indeed, eternally operative.

Our observational awareness
And Newton's proof
Of the mass-attraction law
Governing the Moon's powerful tidal pull
On the Earth's oceans,
In coincidence with our awareness
Of the Moon phase periodicities
Of female humans' menstrual tides,
Gave the Moon's (men's month's) name
To that human blood flow.
Conceivably there could be
Many other effects of celestial bodies
Upon terrestrially dwelling human lives.

In the late 1930s,
When I was science and technology consultant
On its editorial staff, with Russell Davenport
Then managing editor, of *Fortune* magazine,
I found him to be deeply involved with *astrology*.
Russell couldn't understand why I was not actively excited
By the demiscience—astrology,
Since the prime celestial data derived
From scientific observations.
I was not excited
Because I had no experience data

That taught me incisively
Of any unfailingly predictable influence
Upon myself or other Earthians
Which unerringly corresponded
With the varying positions of the solar planets
At the time of the respective human births.
While the planetary interpositionings
At any given time had been scientifically established,
I had no scientifically cogent means for exploring
Their effect upon terrestrial inhabitants.

On the other hand, I found many cogent clues
For exploring the ancient demiscience of numerology.
Ancient numerologists developed
Many tantalizingly logical theories,
Some of which were
Partially acceptable to formal mathematics,
Such as enumeration by "congruence in modulo eight,"
Or, "congruence in modulo ten,"
Or in increments of twelve.

"Congruence in modulo ten" seemed
Obviously induced by
The convenience of the human's ten fingers
As memory-augmenting,
Sequentially bendable,
Counting devices of serial experiences.
Their common appendages of ten fingers each
Provided humans with "natural" and familiar sets
Of experience aggregates
To match with other newly experienced aggregates
As congruent sets.

There was also the popular enumeration system
Based on modulo twelve.
Human counting systems of twelve were adopted
Because the decimal system
Does not rationally embrace
The prime number three.

Since humanity had so many threefold experiences,
Such as that of the triangle's stability,
Or that of the father-mother-child relationships,
Humanity needed an accounting system
That could be evenly and alternatively subdivided
In increments either
Of one, or two, or three.
Ergo, "congruence in modulo twelve"
Was spontaneously invented.

"Invention" means
To bring into novel special-case use
An eternal and universal principle
Which scientific experiment and comprehension
May attest to be generalized principles.

"Etymology" means
The scientific study of words and their origin.
Through etymology man gave names
To their abstract number set concepts.

English is a crossbred
Worldian language.
It is interwoven with Anglo-Saxon,
Old German, Sanskrit, Latin and Greek roots
Interspersed with Polynesian, Magyar, Tatar, et al.
The largest proportion of English words
Are derived from India's Sanskrit,
Which itself embraces hundreds
Of lesser known root languages.

There are a few words whose origins
Have thus far defied scientific identification.
There are not many unidentified root words.
Those of unknown origins
Are classified etymologically as "Old Words."
All but one of the world-around
Words or "names" for numbers
Are classified etymologically as "Old Words."

The one exception is the name for "five,"
Whose conceptual derivation comes directly or indirectly
From word roots identifying the human "hand."
None of the other names for numbers
In any of the human languages
Have pragmatic identifiability
With names for any other known
Physical-experience concepts.

To accommodate the cerebrations
Of those who are reflexively conditioned
To recount their experiences
In twelvefold aggregates—
That is, "congruence in modulo twelve"—
Unique names were etymologically evolved
For the numbers *eleven* and *twelve*
As well as for the numbers *one* through *ten.*
In the new world-around-accepted computational system
Of "congruence in modulo ten"—
That is, the *decimal* system—
The numbers zero through ten
Are called "cardinal" numbers.

But the English names "eleven" and "twelve,"
Or French names "onze" and "douze,"
Or the Germans' "elf" and "zwoelf,"
Likewise are cardinal numbers
In the duodecimal system,
And their cardinal names are used
Even when employed in the decimal system.

Following twelve in the duodecimal system
The number names are no longer *cardinal.*
They are called *ordinal* numbers, which are produced
By combining one, two, or three with ten:
Thir-teen, four-teen, fif-teen, etcetera,
Which are three-ten and four-ten, alliterated
In English, French, and German.

It is not until thirteen is reached
That the process of counting ordinally (three plus ten)
Is employed in the ordinal naming of numbers
Where numbers are communicable by sound.

There are, however, number systems
Based on other pragmatic considerations.
Roman numerals constituted
An exclusively visual method
Of tactilely scoring or scratching
Of a one-by-one exclusively "visual" experience.
When nonliterates were assigned
To counting items such as sheep,
They made one tactile scratch
For one visually experienced sheep,
And a second tactile scratch
As another sheep passed visually,
And another scratch
As the next sheep passed.
The scratch was not a number,
It was only a tactile reaction
To visual experience.
It was a one-by-one,
Tooth-by-tooth intergearing
Of two prime
Sensorially apprehending systems—
Those of touch and sight.

While literate you, in retrospect, could say
That you see *three* scratches,
That is reflexively occasioned
Because you have learned to see groups
And because you have
A sound word for a set of three;
But nonliterate Roman servants who were scoring
Did not have to have number words
To match with tactile one-by-one scratching
Their one-by-one visually experienced,

One-by-one passing-by sheep.
The man doing the scratching
Did not have to have
Any verbal number words or set concepts.
Those landlords, priests, bankers,
Or unsolicited "protection" furnishers
Who were interested
In trading, taxing, or extracting
Life-sustaining wealth—
As sheep or wheat productivity—
Alone were concerned
With the specific total numbers of scratches
And of the total sheep or bags of grain
The ignorant servants had scratchingly matched.
From these total numbers
They calculated how many sheep or bags
They could extract for their taxes
Or landlord's tithe,
Or protectionist's fee,
Or banker's "interest"
Without totally discouraging
The sheepherders' or farmers' efforts.

"Pays" means land.
The shepherds and farmers
Were known as pagans
Or paysants, peasants,
I.e., land-working illiterates.

Because the first millennium A.D.
Roman Empire dominating Mediterranean world
Was so pragmatically mastered
By landlords and their calculating priests,
It is in evidence
That the Roman numerals constituted only
A one-by-one scoring system
In which the V for five and X for ten
Were tactilely "sophisticated" supervisor's

Tallying or *totaling* check marks
Which graphically illustrated
Their thumb's angular jutting out
From the four parallel packed fingers
Or digits of the totaler's free hand.
On the other hand, the intellectually conceived Arabic numerals
Were graphic symbols
For the named sets
Of spontaneously perceived number aggregates.
The Arabic numerals
Did not come into use in the Mediterranean world
Until 700 A.D.
This was a thousand years after the Greeks had developed
Their intellectually conceived *geometry*.

The 700 A.D. introduction of Arabic numerals
Into the knowledge-monopolized economic transactions
Of the ignorance-enweakening Roman Empire
And Mediterranean European world in general
Occurred under the so-called "practical" assumption
That the Arabic numerals were only
Economical "shorthand" symbols
For the Roman scratches.
To the nonliterate ninety-nine percent of society,
It was obviously much easier to make a "3" squiggle
Than to make three separate vertical scratch strokes.
But to the illiterate the symbols
Did not conjure forth a number name.

The earliest calculating machine
Is the Chinese-invented abacus.
It is an oblong wooden frame
Which is subdivided
Into a large rectilinear bottom
And small top rectilinear areas
By a horizontal wooden bar
Running parallel to the top of the frame.
The frame's interior space is further subdivided

By a dozen or more
Perpendicularly strung parallel wires
Or thin bamboo rods.
There are four beads
Strung loosely into each of the wires
Below the horizontal crossbar,
And one bead strung loosely
Above the bar on each wire.
Start use of the abacus
With all the beads at bottom
Of their compartments.
In this all-lowered condition,
The columns are all "empty."
To put the number one
Into the first column on the right,
The topmost of the bottom four beads
Is elevated to the horizontal mid-bar.
To put the number two,
Two bottom beads are elevated to this bar.
To put five into the first column,
Lower all four bottom beads
And elevate the top bead.
To enter nine, leave the top bead elevated
And push up four beads
In the bottom section
On the first right-hand wire.
To enter ten,
Lower all beads in the right-hand column
Both above and below the crossbar;
Now elevate one bead In the bottom section
Of the second column from the right.
The first two right-hand columns read
One and zero, respectively,
Which spells out "ten."
The totaling bead
With a value of five In the separate compartment
At the head of each column
Permitted the release to *inactive* positioning

At the bottom of their wires
Of the one-by-one elevated bead aggregates.
Lowering of all beads
Permitted "empty columns" to occur.
Moving of the tenness leftward
Permitted progressive positioning,
Which integrated or differentiated out
As multiplication or division.

To those familiar with its use,
The tactile-visual patterns
Of the bead positions of the abacus
Could be mentally re-envisioned, or recalled
And held as afterimage sets
In the *image*-ination,
Which could be mentally manipulated
As columns of so many beads
Which read out progressively
As successively adjacent columns
Of so many beads,
Which, when reaching fiveness,
Called for moving "up" the one bead
Of the totaling head-compartment set,
While releasing the previously aggregated
Lower four beads
To drop into their empty-column condition.
When an additional four beads
Were pushed upwardly in the column,
An additional fiveness accrued.
All the beads in the column were lowered,
And one was entered
On the bottom compartment
Of the next leftward column,
As the two columns now read as "ten."
It was easier to enter
Many columned numbers in the abacus
And to add to them
Multicolumned numbers.

This process then permitted
Multiplication and division as well.

When an abacus was lost overboard or in the sands,
The overseas or over-desert navigator
Could sketch a picture
Of the abacus in the sand
Or on a piece of wood
With its easily remembered columns.
These abacus picturers invented
The "arabic" or abacus numerals
To represent the content
Of the successive columnar content of beads.
Obviously this abacus column imagining
Called also for a symbol
To represent an empty column,
And that symbol became the cyphra—
Or in England, cypher,
Or in American, cipher,
Or what we symbolize as 0,
And much later renamed "zero"
To eliminate the ambiguity
Between the identity of the word cypher
With the word for secret codes
And the word for the empty number,
All of which mathematical abacus elaboration
Became known scoffingly as "abracadabra"
To the 99 percent nonliterate world society,
And to the temporal power leaders
Who feared its portent
As an insidious disrupter
Of their ignorance-fortified authority.

Because of its utterly pragmatic bias,
The Roman culture had no numerical concept
Of "nothing"
That corresponds to the abacus's empty column—
That is, the idea of "no sheep"

Was ridiculous. Humans cannot eat "no sheep."
When the Europeans first adopted the Arabic numerals
in 700 A.D.
As "shorthand" for Roman numeral aggregates,
They of course encountered the Arabic cypher,
But they had no thinkably identifiable experiences to
associate with it.
"Nothing" obviously lacked "value."
For this reason, the Mediterranean Europeans
Thought of the cypher only as a decoration
Signifying the end of a communication
In the way that we use the word "over"
In contemporary radio communication.
The cypher was just an end *period*,
Just a decorative terminal symbol.

It was not until 1200 A.D.
Or five hundred years later,
That the works of a Persian named Algorismi
Were translated into
Latin and introduced into Europe.
Algorismi lived in Carthage, North Africa.
He wrote the first treatise explaining
How the Arabic cypher functioned calculatively
By progressively moving leftward
The newly attained tenness
By elevating one bead at the bottom
Of the bottom section
Of the next leftwardly adjacent column in multiplication
And next rightwardly in division.
Thus complex computation could be effected
Which had been impossible with Roman numerals.
The Arabic cypher had been used
For several millenniums
In the computational manner,
First in the Orient,
Then in Babylon and Egypt.
But such calculations had never before been made

In the Roman Empire's Mediterranean world.
No matter how intuitively
A man might have felt
About the probable significance
Of the principle of leverage
Or about the science of falling bodies,
Previous to the knowledge
Of the cypher's capabilities to position numbers,
He could not compute
Their relative effectiveness values
Without "long" multiplication and division.

The introduction into Europe
Of the computational significance of the cypher
Was an epoch-initiating event
For it made it possible for *anybody* to calculate.
And this was the moment in which
For the first time
The Copernicuses and Tycho Brahes,
The Galileos and Newtons,
The Keplers and Leonardos
Had computational ability.
This broke asunder the Dark Ages
With intellectual enlightenment
Regarding the scientific foundations
And technological responsibilities
Of cosmic miracles,
Now all the more miraculous
As the everyday realizer
Of all humanity's innate capabilities.

When I first went to school in 1899,
The shopkeepers in my Massachusetts town asked me
If I had "learned to do my cyphers"
By which key word—"cypher"—
They as yet identified all mathematics.
Even in 1970
Accountants in India

Are known officially as "cypherists."

Tobias Dantzig, author of *Number: The Language of Science,*
Has traced the etymological history
Of the names for the numbers
In all the known languages of the Earth.
He finds the names for numbers all classifiable
As amongst the "oldest" known words.
Sir James Jeans said "Science is the attempt
To set in order the facts of experience."
Dantzig, being a good scientist,
Undertook to set in order
The experienced facts of the history
Of the language of number names.
He arranged them experimentally
In their respective ethnic language columns.
Juxtaposed in this way
We are provided with new historical insights.
For instance, we learn
That if we are confronted
With two numbers of different languages,
Words that we have never seen before,
And an authority assures us
That one of these words means "one"
And the other means "two,"
And we are then asked to guess
Which of them means "one"
And which means "two,"
We will be surprised to find
That we can tell easily which is which.
"One" in every language
Starts with a vowel—
Eins, un, odyn, unus, yet, ahed—
And has vowel sound emphasis,
While "two" always has a consonant sound in the front—
Duo, zwei, dva, nee, tnayn, and so forth,
And has a consonant sound emphasis.
For instance, the Irish-Gaelic

Whose ancestors were sea rovers
Say "an" for one and "do" for two.
These vowel-consonant relations
Hold through into the teens—
Eleven, twelve—in English
Onze, douze—in French
Elf, zwoelf—in German,
With vowels for "oneness"
And consonants for "twoness."

Despite the dissimilarity in different languages
For the names for the same experiences,
And despite the unknown origins of the concepts
From which all numbers but five were derived,
The whole array of names for the numbers
In different languages
Makes it perfectly clear
That the names given the numbers around the world
Grew from the same fundamental
Conceptioning and sound roots.

In view of the foregoing discovery,
We either have to say that some angels
Invented the names for numbers
And the phonetically soundable
Alphabetical letter symbols
With which to spell them
And wrote them on parchments
And air-dropped those number-name leaflets
All around the spherical world,
Thus teaching world-around people the same number names:
Or we have to say that the numbers were invented
By one-world-around-traveling people.

However, if we adopt the latter possibility,
It becomes obvious that no single generation of people
Could, within its lifetime,
Or, in fact, within many lifetimes

Travel all around the world on foot,
For the world's lands are islanded.
But one way humans could get around,
And in a relative hurry,
Was by "high-seas-keeping" sailboats.
It thus becomes intuitively logical
To assume that sailors discovered
And invented the numbers
And inculcated their use
All around the world.

The Polynesians, we know,
Sailed all over the Pacific.
They probably sailed
From there into the Atlantic and Indian oceans
By riding ever-west-toward-east "Roaring Forties"—
The Forty-South latitudes'
Ever-eastward-revolving
Waters and atmospheric winds
Which circle around the vast Antarctic continent.
The "Roaring Forties"
Constitute a gigantic hydraulic-pneumatic merry-go-round,
Which as demonstrated by
World-around single-handing sailors of the 1960s
Enables those who master its ferocious waters
To encircle the world
Within only a year's time.
The Magellans, Cooks, and Slocums
With slower vessels circumnavigated in two years,
In contradistinction to the absolute inability
To go all around the world on foot.
The circumnavigation of the one-ocean world
Which covers three-quarters of our planet
Makes it obvious that the names for numbers
Were conceived by the sailors.
As Magellan, Cook, and later Slocum
Came to the Tierra del Fuego islanders,
They were surrounded by the islanders,

Who lived by pillaging passing ships
And must have been doing so
Profitably for millenniums.
To explain their sustained generations
In an environment approximately devoid
Of favorable human survival,
Except by piracy and salvage
Of the world-around sailing vessels
Funneled through the narrow
And incredibly tumultuous
Waters of the Horn Running between Antarctica and South America,
With often daily occurring
One-hundred-feet high waves
Cresting at the height
Of ten-story buildings,
Their thousand-ton tops
Tumblingly sheared off to leeward
By hundred-miles-an-hour superhurricanes
Avoidance of whose worst ferocities
Could be accomplished by winding
Through the Strait of Magellan,
Whose fishtrap-like strategic enticement
Often lured Pacific-Atlantic sea traffic
Into those pirates' forlorn domain.

With eighty-five percent of Earth's dry land
And ninety percent of its people
Occupying and dwelling north of the Equator
In the northern, or land-dominant, hemisphere;
And with less than one-tenth of one percent of humanity
Dwelling in the southernmost half
Of the southern, or wave-dominated, Earth hemisphere,
There is more and more scientific evidence accruing
That sailors have been encircling the Earth
South of Good Hope,
North or south of Australia,
And through the Horn
Consciously and competently

For many thousands of millenniums
All unknown to the ninety-nine percent of humanity
That has been "rooted" locally To their dry-land livelihoods.
The European scholars of the last millennium
Have considered the Polynesians to be illiterate
And therefore intellectually inferior to Europeans
Because the Polynesians didn't have a written history
And used only a binary mathematics,
Or "congruence in modulo two."
The European scholars scoffed,
"The Polynesians can only count to two."

Since the Polynesians lived on the sea
And were naked,
Anything upon which they wrote
Could be washed overboard.
The Polynesians themselves
Often fell overboard.
They had no pockets
Nor any other means
Of retaining reminder devices
Or calculating and scribing instruments
Other than by rings
That could not slip off
From their fingers, ankles, wrists, and necks,
Or by comblike items
That were precariously
Tied into the hair on their heads
Or by rings piercing their ears and noses.
These sea people had to invent ways of calculating and communicating
Principally by brain-rememberable pattern images.
They accomplished their rememberable patterns in sound,
They remembered them in chants.
With day after day of time to spend at sea
They learned to sing and repeat these chants.
Using the successive bow-to-stern,
Canoe and dugout, stiffing ribs and thwarts

Or rafters of their great rafts
As re-minders of successive generations of ancestors,
They methodically and recitationally recalled
The experiences en-chantingly taught to them
As a successive-generation,
Oral relay system
Specifically identified with the paired ancestral parents,
Represented by each pair of ship's ribs or rafters.
When they landed for long periods
They upside-downed their longboats
To provide dry-from-rain habitats.
(The word for "roof" in Japan
Also means "bottom of boat.")
Staying longer than the wood-life of their hulls,
They built long halls patterned after the hulls.
Each successive column and roof rafter
Corresponded with a rib of their long boat.
Gradually they came to carve
Each stout tree column's wood
To represent an ancestor's image.
Each opposing pair of parallel columns
Represented a pair of ancestors:
The male on the one hand
And the female on the other hand.
While most Europeans or Americans can recall
Only ten or less generations of ancestors,
In their chants
The Polynesians can recall
As much as one hundred generations
Of paired ancestors,
And their chants include
The history of their important discoveries
Such as of specific-star-to-specific-star directions
to be followed at sea
In order to navigate from here to there.
While many of the words
That their ancestors evolved
To describe their discoveries

Have lost present-day identification,
They continue to sing these words
In faithful confidence
That their significant meaning
Will some day emerge.
Therefore, they teach their children
As they themselves were taught—
To chant successively the special stories
Which include words of lost meaning—
Describing each one of every pair of ancestors.
That is why the Vikings
Had their chants and sagas
And why sailors all around the world
Chant their chanties—"shanties"
As they heave-hoed rhythmically together.

Thus too did the Viking sing their sagas;
And the Japanese and Indian sailors their ragas;
And the Balinese sailors their gagas,
Meaning "tales of the old people,"
Amongst all those high-seas-living world dwellers
Whose single language structure
Served the thirty-million-square-mile living Maoris;
Whereas hundreds of fundamentally different languages
Were of static-existence necessity developed,
For instance, by isolatedly living tribes
Of exclusively inland-dwelling New Guineans.

A nineteenth-century sailor's shanty goes
"One, two, three, four
Sometimes I wish there were more.
Eins, zwei, drei, vier
I love the one that's near.
Yet, nee, same, see
So says the heathen Chinese.
Fair girls bereft
Then will get left
One, two, and three."

As complex twentieth-century,
Electronically actuated computers
Have come into use,
Ever improving methodology
For gaining greater use advantage
Of the computers' capabilities,
As information storing,
Retrieving, and interprocessing devices,
Has induced reassessment
Of relative mathematical systems' efficiencies.
This in turn has induced
Scientific discovery
That binary computation
Or operation by "congruence in modulo two"
Is by far the most efficient and swift system
For dealing universally with complex computation.
In this connection we recall that the Phoenicians
Also as sailor people
Were forced to keep their mercantile records
And recollections in sound patterns,
In contradistinction to tactile and visual scratching—
And that the Phoenicians to implement
Their world-around trading
Invented the Phoenician,
Or Phonetic, or word-sound alphabet,
With which to correlate and record graphically
The various sound patterns and pronunciations
Of the dialects they encountered In their world-around trading.
And we suddenly realize
How brilliant and conceptually advanced
Were the Phoenicians' high-seas predecessors,
The Polynesians,
For the latter had long centuries earlier
Discovered the binary system of mathematics
Whose "congruence in modulo two"
Provided unambiguous,

Yes-no; go-no go,
Cybernetic controls
Of the electronic circuitry
For the modern computer,
As it had for millenniums earlier
Functioned most efficiently
In storing and retrieving
All the special-case data
In the brains of the Polynesians
By their chanted programming
And their persistent retention
Of the specific but no-longer-comprehended
Sound pattern words and sequences
Taught by their successive
Go-no go, male-female pairs of ancestors.
This realization forces rejection of the European scholars'
Former depreciation of the Polynesian competence,
Which reversal is typical
In both conceptioning and logic
Of the myriad of concept reversals
That are now taking place
And are about to occur
In vastly greater degree
In the late twentieth-century academic world.
The general education system
Has not yet formally acknowledged
The wholesale devaluation
Of their formally held
"Scholarly opinions and hypotheses,"
But that devaluation
Is indeed taking place
And is powerfully manifest
In the students' loss of esteem
For their intellectual wares.

All of the foregoing
Newly dawning realizations
Point up the significance

Of the world-around physically cross-bred kinship
Of the world's "one-ocean" sailors
Whose Atlantic, Pacific, and Indian waters
Were powerfully interconnected
By the Antarctic-encircling
"Roaring Forties."
Polynesians, Phoenicians, Venetians, Frisians, Vikings
(Pronounced "Veekings" by the Vikings)
All alliterations of the same words.
All evolved from the same ancestors.

The sea was their normal life,
And since three-quarters of the Earth's surface
Is covered with water,
"Normal" life would mean living on the sea.
The Polynesians spontaneously conceive of an island
As a "hole" in the ocean.
Such conceptioning of a negative hole in experience
Brought about their natural invention
Of a symbol for nothing—the zero.
This is negative space conceptioning
And is evident in the Maori paintings.
What is a peninsula to land people
Is a "bay" to them.
The Maori also look at males and females
In the reverse primacy of the land-stranded Western
culture.
Seventy-five percent of the planet is covered by the sea.
The sea is normal.
The male is the sailor.
The male is normal.
The penis of the normal sea
Intrudes into the female land.
The bay is a penis of the sea.
The females dwell upon the land.
To the landsman the peninsula or penis
Juts out into the ocean.

On the Indian Ocean side of southeast Africa,
The Zulus are linked with this round-the-world water sailing.
They are probably evolved from the Polynesians of long ago
Swept westward by the monsoons.
I found some of the Zulu chiefs
Wearing discs in their ears
Upon which the cardinal points of the compass
Were clearly marked.
The "Long Ears" of Easter Island
Had their ears pierced and stretched
To accommodate their navigational devices.
Many of the items which European society
Has misidentified in the Fijis as superstitious decoration
Were and as yet are
Navigational information-storing devices,
Being stored, for instance,
As star-pattern combs in their hair,
As rings around their necks,
Or as multiple bracelets
Mounted on their two arms and two legs,
And multiple rings
Upon the four fingers of their hands.
They had thirteen columns of slidable counters,
One neck, eight fingers, two arms, two legs.
Most of the earliest known abacuses
Also have thirteen columns of ring (bead) counters
Which became more convenient to manipulate and retain
When rib-bellied ships
Supplanted the open raft and catamaran.
Once the mathematical conceptioning
Of sliding rings on thirteen columns
Had been evolved by the navigators, traders, magicians,
It was no trick at all
To reproduce the thirteen-column system
In a wooden frame with bamboo slide columns.

By virtue of their ability to go
From the known here to the popularly unknown there,
The navigators were able to psychologically control
Their local island chieftains.
If a chieftain needed a miracle
To offset diminishing credit by his people,
He could confront them with his divine power
By exhibiting some object they had never seen before,
Because it was nonexistent
On their particular island.
All the chieftain had to do
Was to ask the navigators
To exercise their mysterious ability
To disappear at sea
And return days later with an unfamiliar object.
But the navigators kept secret
Their mathematical knowledge
Of offshore celestial navigation
And the lands they thus were able to reach.

To the landed chieftains
The seagoing navigators were mysterious priests.
The South Seas navigators lived and as yet live
Absolutely apart from the chieftains and the tribe
The "priests" taught only their sons about navigation
And they did so only at sea.
A new era dawned
For humanity on our planet
When the Polynesians learned
How to sail zigzaggingly to windward
Into the prevailing west-to-east winds.
Able to sail westward—
Able to follow the Sun—
At far greater sustainable
(All day and all night, day after day)
Sailing speeds than those attainable
By paddling or rowing into head seas;
Having for all time theretofore drifted

In predominantly eastward windblown directions,
Or gone aimlessly where ocean currents bore them,
Yielding to the inevitable
From-west-to-east elements
Bearing them to the American west coasts
And to all the Pacific islands
Throughout the previous *x* millions of years.

Whereas the Southern Hemisphere ocean
Was dominated by the west-east "Roaring Forties,"
The Polynesians when entering the Northern Hemisphere
Were advantaged not only by their ability
To sail into the wind,
But also by the east-west counter-currents
Of the tropical westward trade winds,
Which they discovered and
Called so because they made it possible
To go back where man had previously been
And thus to integrate world resources.
Thus the secretly held navigational capability
And knowledge of the elemental counting and astronomy
Went westward from Polynesia
Throughout Malaysia and to southern India,
Across the Indian Ocean to Mesopotamia and Egypt
And thence into the Mediterranean.
The powerful priests of Babylon, Egypt, and Crete
Were the progeny of mathematician navigators of the Pacific
Come up upon the land
To guide and miracle-ize the new kings
Of the Western Worlds.
Knowing all about boats,
These navigator priests were the only people
Who knew that the Earth is spherical,
That the Earth is a closed system
With its myriad resources chartable.
But being water people,
They kept their charts in their heads
And relayed the information

To their navigator progeny
Exclusively in esoterical,
Legendary, symbolical codings
Embroidered into their chants.

But some of their numbers
Also sailed deliberately eastward
Carrying their mathematical skills
To west-coast America.

The Mayans used base twenty in their numerical system
By counting with both their fingers and toes.
The number twenty often occurs
In a "magically" strategic way.
For an example
We can look at symmetrical aggregates
Of progressively assembled spheres
Closest packed on a plane—a pool table.
First take two balls and make them tangent.
Tangent is the "closest"
That spheres may come to one another.
We may next nest a third ball
In the valley between the first tangent two.
Now each of the three spheres is tangent to two others
And none can get closer to each other.
These three make a triangle.
There is no ball in the center
Of the triangular group.
We can now add three more balls to the first three
By arranging them tangentially in a row
Along one edge of the first three's triangle.
As yet, all six balls are arranged
As outside edges of the triangle.
Not until we add a fourth row of balls
Nested along one edge of the triangular aggregate
Does a single ball become placed as the nuclear ball
In the center of the triangular "patterned" ball pool-table array.
Ten is the total number of balls

In this first nuclear-ball-containing triangle:
Nine surround the nuclear tenth ball.
And since a triangle is a fundamental structural pattern,
And since the triangular aggregate
Of nine balls around a nuclear one
Is a symmetrical array,
Man's intuitive choice of "congruence in modulo ten"
May have been more subtly conceived
Than simply by coincidence
With the ten digits of his hands.

We will now see what happens experimentally
When sailors stack coconut or orange cargoes
Or when we stack planar groups of triangular aggregates of spheres
On top of one another in such a manner that they will be
Structurally stable without binding agents.

First we will nest six balls
In a closest-packed triangular planar array
On top of the first triangularly arranged ten-ball aggregate.
And on top of those six balls
We can nest three more.
We now have a total of nineteen balls.
We may now nest one more topmost ball
In the one "nest" of the three-ball triangle.
We now have a symmetrical
Tetrahedral aggregate
Consisting of twenty balls
Without any nuclear ball
Occurring in the center
Of the symmetrical tetrahedral pyramid of balls.
We began our vertical stacking
With a symmetrical base triangle of ten balls,
And now we have a tetrahedron composed of twenty balls.
Just as fingers alone may not have been the only reason
For the choice of base ten,
Fingers and toes together may not have been the only reason
That the Mayan priests chose
Congruence in modulo twenty

Or that twenty was considered a magical number.
It might have been the result of an intuitive understanding
Of closest packing of spheres,
Which is something much more fundamental.
For unlike our fingers which lie in a row,
The packing of twenty spheres
That can be grouped symmetrically together without a nucleus
Is a fundamentally significant phenomenon.
In a tetrahedron composed of twenty balls
There is no nucleus.
This may be why twenty appears so abundantly
In the different chemical element isotopes.
And "twenty" is one of the "Magic Numbers"
In the inventory of chemical-element isotopal abundancy in Universe.

In order to position a nuclear ball in the center
Of a symmetrical tetrahedral pyramid of balls,
We need to add another or fifth nested layer of fifteen
balls
To one face of the tetrahedron of twenty.
The total number of balls is then thirty-five,
Of which one is the nuclear ball.
If, however, we add four
Progressively larger
Triangular layers of balls
To each of the four triangular faces
Of the twenty-ball, no-nucleus tetrahedron,
It will take exactly one hundred more balls
To enclose the twenty-ball, no-nucleus tetrahedron—
This makes a symmetrical tetrahedron
Of one hundred and twenty balls.
This symmetrical tetrahedron
Is the largest symmetrical assembly
Of closest-packed spheres nowhere containing
Any two-layer-covered nuclear spheres
That is experimentally demonstrable.
In the external affairs of spheres
Such omnidimensional spherical groupings

Of one hundred and twenty same-size balls
Without a nucleus ball
Can be logically identified
With the internal affairs
Of individual spheres,
Wherein we rediscovered
The one hundred and twenty,
Least-common-denominator,
Right spherical triangles of the sphere,
Which are archeologically documented
As having been well known to the Babylonians'
Come-out-upon-the-land-ocean,
Navigator-high-priest mathematicians.

The number 120 also appears as a "Magic Number"
In the relative-abundance hierarchy
Of chemical-element isotopes of Universe.
One hundred and twenty accommodates
Both the decimal and the duodecimal system
(Ten multiplied by twelve).

The Mayans too may have understood
About the tetrahedral closest packing of spheres.
They probably made such tetrahedra
With symmetrically closest-packed stacks of oranges.

The twentieth-century fruit-store man
Spontaneously stacks his spherical fruits
In such closest-packed
Stacking and nesting arrays.
But the physicists didn't pay any attention
To the fruit-store man until 1922.
Then for the first time physicists
Called the tetrahedral stacks of fruit
"Closest packing of spheres."
For centuries past
The numerologists had paid attention
To the closest packing of spheres In tetrahedral pyramids,
But were given the academic heave-ho

When in the mid-nineteenth century
Physicists abandoned the concept of models.
We have seen
That there are unique or cardinal names
For the concepts one through twelve
In England and Germany,
And for the concepts one through sixteen in France,
But that after that they simply repeat
In whatever congruence modulos
They happen to be working.
The Arabic numerals as well as their names
Are unique and stand alone
Only from zero through nine.
However, eleven is the result of two ones—11,
And twelve is similarly fashioned from two
Previously given symbols,
Namely, one and two—12.

But certain numbers
Such as prime numbers
Have their own cosmic integrity
And therefore ought to be integrally expressed.
What the numerologist does
Is to add numerals horizontally (120=1+2+0=3)
Until they are all consolidated into one integer.
Numerologists have also assigned
To the letters of the alphabet
Corresponding numbers: A is one, B is two, C is three, etc.
Numerologists wishfully assume
That they can identify
Characteristics of people
By the residual integer
Derived from integrating
All of the integers,
(Which integers
They speak of as digits,
Identifying with the fingers of their hands,
That is, their fingers.)

Corresponding to all the letters
In the individual's complete set of names.
Numerologists do not pretend to be scientific.
They are just fascinated
With correspondence of their key digits
With various happenstances of existence.
They have great fun
Identifying events and things
And assuming significant insights
Which from time to time
Seem well justified,
But what games numerologists
Chose to play with these tools
May or may not have been significant.
Possibly by coincidence, however,
And possibly because of number integrity itself
Some of the integer intergrating results
Are found to correspond elegantly
With experimentally proven, physical laws
And have subsequently proven to be
Infinitely reliable.
Half a century ago I became interested in seeing
How numerologists played their games.
I found myself increasingly intrigued
And continually integrating digits.

Next Section: 1220.00

1220.00 **Indigs**

1220.10 **Definition:** All numbers have their own integrity.

1220.11 The name *digit* comes from *finger*. A finger is a digit. There are five fingers on each hand. Two sets of five digits give humans a propensity for counting in increments of 10.

1220.12 Curiosity and practical necessity have brought humans to deal with numbers larger than any familiar quantity immediately available with which to make matching comparison. This frequent occurrence induced brain-plus-mind capabilities to inaugurate ingenious human information-apprehending mathematical stratagems in pure principle. If you are looking at all the pebbles on the beach or all the grains of sand, you have no spontaneous way of immediately quantifying such an experience with discrete number magnitude. Quantitative comprehension requires an integrative strategy with which to reduce methodically large unknown numbers to known numbers by use of obviously well- known and spontaneously employed linear-, area-, volume-, and time-measuring tools.

1220.13 **Indig Table A: Comparative Table of Modular Congruences of Cardinal Numbers:** This is a comparative table of the modular congruences of cardinal- number systems as expressed in Arabic numerals with the individual integer symbols integrated as *indigs*, which discloses synergetic wave-module behaviors inherent in nature's a priori, orderly, integrative effects of progressive powers of interactions of number:

Visually	Nonintegrated	Indigs	Indig
1	1	1	
11	11	2	
1 1 1	111	3	
11 11	1111	4	
11 1 11	11111	5	
111 111	111111	6	
111 1 111	1111111	7	
11 11 11 11	11111111	8	

111 111 111	111111111	9	
two hands	1111111111	10	1
too much	11111111111	11	2

1220.14 Man started counting large numbers which he did not recognize as a discrete and frequently experienced pattern by modularly rhythmic repetitive measuring, or matching, with discrete patterns which he did recognize—as, for instance, by matching the items to be counted one for one with the successive fingers of his two hands. This gave him the number of separate items being considered. Heel-to-toe stepping off of the number; or foot-after-foot length dimensions; or progressively and methodically covering areas with square woven floor mats of standard sizes, as the Japanese *tatami* and *tsubo;* or by successive mouthfuls or handfuls or bowls full, counted on the fingers of his hands, then in multiples of hands (i.e., multiples of ten), gave him commonly satisfactory volume measurements.

1220.15 Most readily humans recognized and trusted one and one making two, or one and two making three, or two and two making four. But an unbounded loose set of 10 irregular and dissimilar somethings was not recognizable by numbers in one glance: it was a lot. Nor are five loose, irregular, and dissimilar somethings recognizable in one glance as a number: they are a bunch. But a human hand is boundaried and finitely recognizable at a single glance as a *hand*, but not as a discrete number except by repetitively acquired confirmation and reflexive conditioning. Five is more recognizable as four fingers and a thumb, or even more readily recognizable as two end fingers (the little and the index), two fingers in the middle, and the thumb (2 + 2 + 1 = 5).

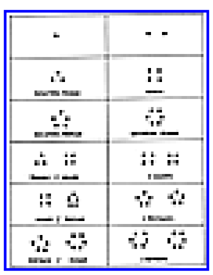


Fig. 1220.16

1220.16 Symmetrical arrays of identically shaped and sized, integrally symmetric objects evoke spontaneous number identification from *one to six*, but not beyond. Paired sets of identities to six are also spontaneously recognized; hence we have dice and dominoes.

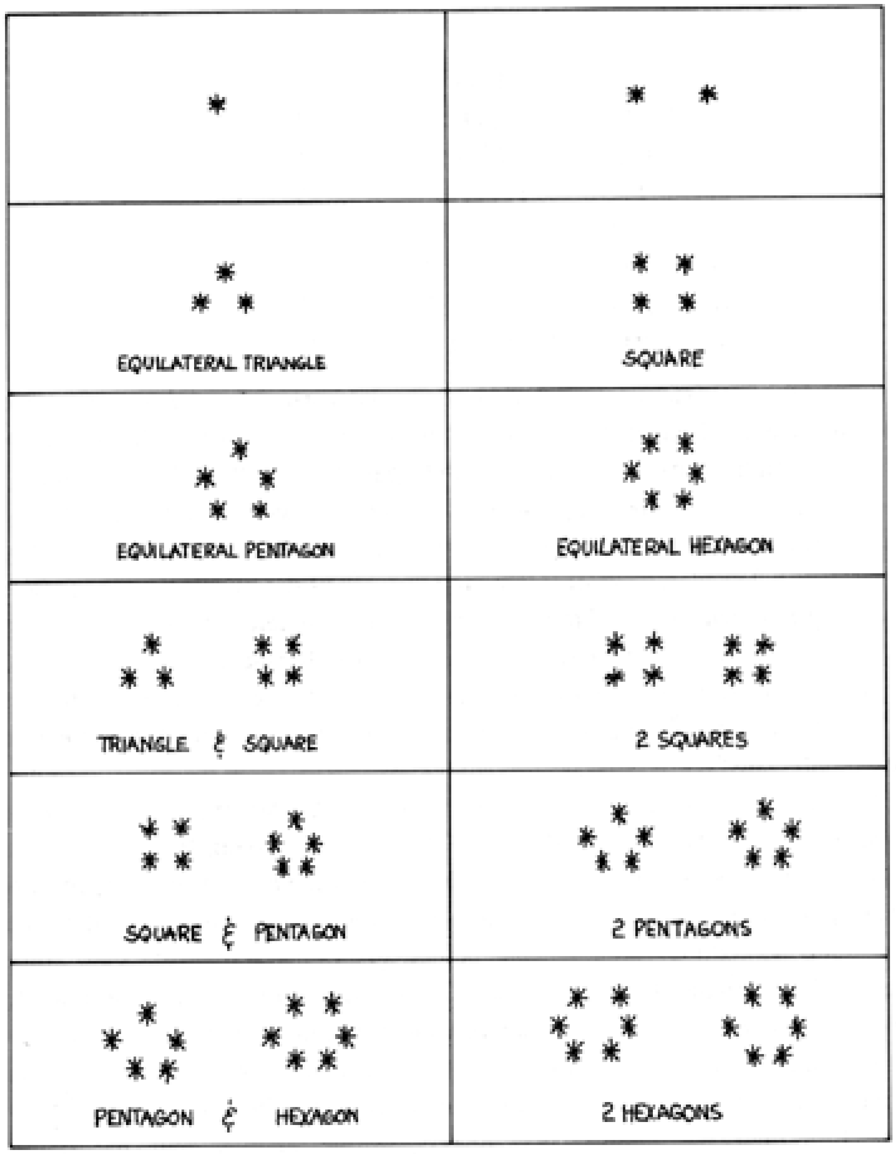

EQUILATERAL TRIANGLE
SQUARE
EQUILATERAL PENTAGON
EQUILATERAL HEXAGON
TRIANGLE & SQUARE
2 SQUARES
SQUARE & PENTAGON
2 PENTAGONS
PENTAGON & HEXAGON
2 HEXAGONS

Fig. 1220.16.

1220.17 Thus humans learned that collections of very large numbers consist of multiples of recognizable numbers, which recognition always goes back sensorially to spontaneously and frequently proven matching correspondence with experientially integrated pattern simplexes. One orange is a point (of focus). Two oranges define a line. Three oranges define an area (a triangle). And four oranges, the fourth nested atop the triangled first three, define a multidimensional volume, a tetrahedron, a scoop, a cup.[1]

(Footnote 1: This may have been the genesis of the cube— where all the trouble began. Why? Because man's tetrahedron scoop wpuld not stand on its point, spilled, frustrated counting, and wasted valuable substances. So humans devised the square-based volume: the cube, which itself became an allspace-filling multiple cube building block easily appraised by "cubing" arithmetic.)

1220.20 **Numerological Correspondence:** Numerologists do not pretend to be scientific. They are just fascinated with a game of correspondence of their "key" digits— finger counts, ergo, 10 digits—with various happenstances of existence. They have great fun identifying the number "seven" or the number "two" types of people with their own ingeniously classified types of humans and types of events, and thereafter imaginatively developing significant insights which from time to time seem justified by subsequent coincidences with reality. What intrigues them is that the numbers themselves are integratable in a methodically reliable way which, though quite mysterious, gives them faithfully predictable results. They feel intuitively confident and powerful because they know vaguely that scientists also have found number integrity exactly manifest in physical laws.

1220.21 The numerologists have also assigned serial numbers to the letters of the alphabet: A is one, B is two, C is three, etc. Because there are many different alphabets of different languages consisting of various quantities of letters, the number assignments would not correspond to the same interpretations in different languages. Numerologists, however, preoccupied only in their single language, wishfully assumed that they could identify characteristics of people by the residual digits corresponding to all the letters in the individual's complete set of names, somewhat as astrologists identify people by the correspondences of their birth dates with the creative picturing constellations of the Milky Way zoo = Zodiac = Celestial Circus of Animals.

1221.00 **Integration of Digits**

1221.10 **Quantifying by Integration:** Early in my life, I became interested in the mathematical potentials latent in the methodology of the numerologists. I found myself increasingly intrigued and continually experimenting with digit integrations. What the numerologist does is to add numbers as expressed horizontally; for instance:

$$120 = 1 + 2 + 0 = 3$$

Or:

$$32986513 = 3+2+9+8+6+5+1+3 = 37 = 3+7 = 10 = 1+0 = 1,$$

Numerologically, 32986513= 1

Or:

59865279171 = 5+9 = 14+8 = 22+6 = 28+5 = 33+2 = 35+7 = 42+9 = 51+1 = 52+7 = 59+1 = 60 = 6+0 = 6,

Numerologically, 59865279171 = 6.

1221.11 Though I was familiar with the methods of the calculus—for instance, quantifying large, irregularly bound areas—explorations in numerology had persuaded me that large numbers themselves, because of the unique intrinsic properties of individual numbers, might be logically integratable to disclose initial simplexes of sensorial interpatterning apprehendibility.

1221.12 Integrating the symbols of the modular increments of counting, in the above case in increments of 10, as expressed in the ten-columnar arrays of progressive residues (less than ten—or less than whatever the module employed may be), until all the columns' separate residues are reduced to one *integral digit*, i.e., an integer that is the ultimate of the numbers that have been integrated. Unity is plural and at minimum two. (See Secs. 240.03; 527.52; and 707.01.)

1221.13 As a measure of communications economy, I soon nicknamed as *indigs* the final unitary reduction of the integrated digits. I use *indig* rather than *integer* to remind us of the process by which ancient mathematicians counting with their fingers (digits) may have come in due course to evolve the term *integer*.

1221.14 I next undertook the indigging of all the successive modular congruence systems ranging from one-by-one, two-by-two pairs to "by the dozens," i.e., from zero through 12. (See modulo-congruence tables, Sec. 1221.20.)

1221.15 The modulo-congruence tables are expressed in both *decimal* and *indig* terms. In each of the 13 tables of the chart, the little superscripts are the indigs of their adjacently below, decimally expressed, corresponding integers.

1221.16 The number of separate columns of the systematically displayed tables corresponds with the modulo-congruence system employed. Inspection of successive horizontal lines discloses the orderly indig amplifying or diminishing effects produced upon arithmetical integer progression. The result is startling.

1221.17 Looking at the chart, we see that when we integrate digits, certain integers invariably produce discretely amplifying or diminishing alterative effects upon other integers.

One produces a plus oneness;

Two produces a plus twoness;

Three produces a plus threeness;

Four produces a plus fourness.

Whereafter we reverse,

Five produces a minus fourness;

Six produces a minus threeness;

Seven produces a minus twoness;

Eight produces a minus oneness.

Nine produces zero plusness or minusness.

One and ten are the same. Ten indigs (indig = verb intransitive) as a *one* and produces the same alterative effects as does one. Eleven indigs as two and produces the same alterative effects as a two. All the other whole numbers of any size indig to 1, 2, 3, 4, S, 6, 7, 8, or 9—ergo, have the plus or minus oneness to fourness or zeroness alterative effects on all other integers.

1221.18 Since the Arabic numerals have been employed by the Western world almost exclusively as congruence in modulo ten, and the whole world's scientific, political, and economic bodies have adopted the metric system, and the notation emulating the abacus operation arbitrarily adds an additional symbol column unilaterally (to the left) for each power of ten attained by a given operation, it is reasonable to integrate the separate integers into one integer for each multisymboled number. Thus 12, which consists of 1 + 2, = 3; and speaking numerologically, 3925867 = 4.

1	=	+1	+1	
2	=	+2	+2	
3	=	+3	+3	
4	=	+4	+4	+
5	=	5	−4	
6	=	6	−3	
7	=	7	−2	
8	=	8	−1	
9	=	0	0	
10	=	1	+1	
11	=	2	+2	
12	=	3	+3	
13	=	4	+4	−
14	=	5	−4	
15	=	6	−3	
16	=	7	−2	
17	=	8	−1	
18	=	0	0	
19	=	1	+1	
20	=	2	+2	

This provides an octave number system of a plus and minus octave and an (outside-out) and an (indise-out) differentiation, for every system has insideness (concave) and outsideness (convex) as well as two polar hemisystems.

1221.20 **Indig Table B: Modulo-Congruence Tables:** The effects of integers: One is + 1. Two is + 2. Three is + 3. Four is +4. Five is - 4. Six is - 3. Seven is - 2. Eight is -1. Nine is zero; nine is none.
(The superior figures in the Table are the *Indigs.*)

Congruence in Modulo Zero Integrates to Gain or Lose 0:

0 (Like nine) **0**

Congruence in Modulo One Integrates to Gain 1:

1^1	(Each row gains 1
2^2	in each column)
3^3	
4^4	
5^5	**+1**
6^6	
7^7	
8^8	
9^9	
10^1	
11^2	
12^3	

Congruence in Modulo Two Integrates to Gain 2:

1^1	2^2	(Each row gains 2
3^3	4^4	in each column)
5^5	6^6	
7^7	8^8	
9^9	10^1	**+2**
11^2	12^3	
13^4	14^5	
15^6	16^7	

Congruence in Modulo Two Integrates to Gain 3:

1^1	2^2	3^3	(Each row gains 3
4^4	5^5	6^6	in each column
7^7	8^8	9^9	
10^1	11^2	12^3	**+3**
13^4	14^5	15^6	
16^7	17^8	18^9	
19^1	20^2	21^3	

Congruence in Modulo Four Integrates to Gain 4:

1^1	2^2	3^3	4^4	(Each row gains 4
5^5	6^6	7^7	8^8	in each column
9^9	10^1	11^2	12^3	
13^4	14^5	15^6	16^7	**+4**
17^8	18^9	19^1	20^2	
21^3	22^4	23^5	24^6	

Congruence in Modulo Five Integrates to Lose 4:

1^1	2^2	3^3	4^4	5^5	(Each row loses 4
6^6	7^7	8^8	9^9	10^1	in each column
11^2	12^3	13^4	14^5	15^6	
16^7	17^8	18^9	19^1	20^2	**-4**
21^3	22^4	23^5	24^6	25^7	
26^8	27^9	28^1	29^2	30^3	

Congruence in Modulo Six Integrates to Lose 3:

1^1	2^2	3^3	4^4	5^5	6^6	(Each row loses 3
7^7	8^8	9^9	10^1	11^2	12^3	in each column
13^4	14^5	15^6	16^7	17^8	18^9	
19^1	20^2	21^3	22^4	23^5	24^6	**-3**
25^7	26^8	27^9	28^1	29^2	30^3	

Congruence in Modulo Seven Integrates to Lose 2:

1^1	2^2	3^3	4^4	5^5	6^6	7^7	(Each row loses 2
8^8	9^9	10^1	11^2	12^3	13^4	14^5	in each column
15^6	16^7	17^8	18^9	19^1	20^2	21^3	
22^4	23^5	24^6	25^7	26^8	27^9	28^1	**-2**

Congruence in Modulo Eight Integrates to Lose 1:

1^1	2^2	3^3	4^4	5^5	6^6	7^7	8^8	(Each row loses 1
9^9	10^1	11^2	12^3	13^4	14^5	15^6	16^7	in each column)
17^8	18^9	19^1	20^2	21^3	22^4	23^5	24^6	
25^7	26^8	27^9	28^1	29^2	30^3	31^4	32^5	**-1**

Congruence in Modulo Nine Integrates to No Lose or Gain:

1^1	2^2	3^3	4^4	5^5	6^6	7^7	8^8	9^9	(Each row remains
10^1	11^2	12^3	13^4	14^5	15^6	16^7	17^8	18^9	same value in its
19^1	20^2	21^3	22^4	23^5	24^6	25^7	26^8	27^9	column)
28^1	29^2	30^3	31^4	32^5	33^6	34^7	35^8	36^9	**0**

Congruence in Modulo Ten Integrates to Gain 1:

1^1	2^2	3^3	4^4	5^5	6^6	7^7	8^8	9^9	10^1	(Each row gains 1
11^2	12^3	13^4	14^5	15^6	16^7	17^8	18^9	19^1	20^2	in each column)
21^3	22^4	23^5	24^6	25^7	26^8	27^9	28^1	29^2	30^3	
31^4	32^5	33^6	34^7	35^8	36^9	37^1	38^1	39^3	40^4	**+1**

Congruence in Modulo Eleven Integrates to Gain 2:

1^1	2^2	3^3	4^4	5^5	6^6	7^7	8^8	9^9	10^1	11^2	(Each row gains 2
12^3	13^4	14^5	15^6	16^7	17^8	18^9	19^1	20^2	21^3	22^4	in each column)
23^5	24^6	25^7	26^8	27^9	28^1	29^2	30^3	31^4	32^5	33^6	
34^7	35^8	36^9	37^1	38^2	39^3	40^4	41^5	42^6	43^7	44^8	**+2**

Congruence in Modulo Eleven Integrates to Gain 3:

1^1	2^2	3^3	4^4	5^5	6^6	7^7	8^8	9^9	10^1	11^2	12^3	(Each row gains 3
13^4	14^5	15^6	16^7	17^8	18^9	19^1	20^2	21^3	22^4	23^5	24^6	in each column)
25^7	26^8	27^9	28^1	29^2	30^3	31^4	32^5	33^6	34^7	35^8	36^9	
37^1	38^2	39^3	40^4	41^5	42^6	43^7	44^8	45^9	46^1	47^2	48^3	**+3**

Next Section: 1222.00

1222.00 **Absolute Four and Octave Wave**

1222.10 **Prime Dichotomy:** It is found that all decimally expressed whole numbers integrate into only nine digits. Looking at the charts (Indig Table B), we see the nine indigs resultant to the decimal system, or congruence in modulo ten, have integrated further to disclose only nine unique operational effects upon all other integers. These nine interoperational effects in turn reduce into only eight other integer-magnitude-altering effects and one no-magnitude-altering effect. The "octave" of eight magnitude-altering sets of indigs in turn disclose primary dichotomy into four positively altering and four negatively altering magnitude operators, with each set arranged in absolute arithmetical sequence of from one to four only.

1222.11 Indig congruences demonstrate that nine is zero and that number system is inherently octave and corresponds to the four positive and four negative octants of the two polar domains (*obverse* and *reverse*) of the octahedron—and of all systems—which systematic polyhedral octantation limits also govern the eight 45-degree-angle constituent limits of 360-degree unity in the trigonometric function calculations.

1222.12 The inherent + 4, - 4, 0, + 4,—4, 0 → of number also corresponds (a) to the four varisized spheres integrating tritangentially to form the tetrahedron (see Sec. 1222.20 and (b) to the octantation of the Coupler (see Sec. 954.20 954.20) by its eight allspace- filling Mites (AAB Modules) which, being inherently plus-or-minus biased, though superficially invariant (i.e., are conformationally identical); altogether provide lucidly synergetic integration (at a kindergarten-comprehendible level) of cosmically basic number behavior, quantum mechanics, synergetics, nuclear physics, wave phenomena in general, and topologically rational accountability of experience in general.

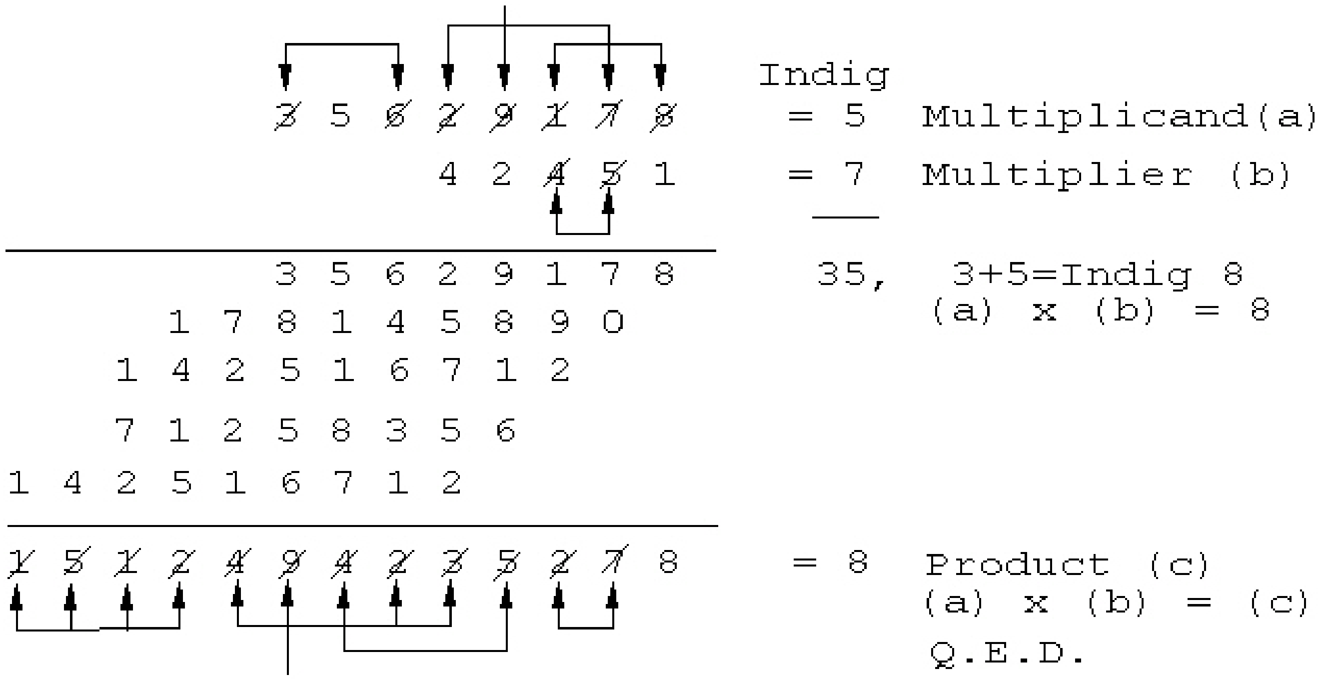
1222.20 **Cosmically Absolute Numbers:** There are apparently no cosmically absolute numbers other than 1, 2, 3, and 4. This primitive foumess identifies exactly with one quantum of energy and with the foumess of the tetrahedron's primitive structuring as constituting the "prime structural system of Universe," i.e., as the minimum omnitriangulated differentiator of Universe into insideness and outsideness, which alone, of all macro-micro Universe differentiators, pulsates inside-outingly and vice verse as instigated by only one force vector impinging upon it. (See Sec. 624.)

1222.30 **Casting Out Nines:** We can use any congruence we like, and the pattern will be the same. The wave phenomenon, increasing by four and decreasing by four, is an octave beginning and ending at zero. From this I saw that nine is zero.

1222.31 When I worked for Armour and Company before World War I, I had to add and multiply enormous columns of figures every day. As yet, neither commercially available adding machines nor electric calculators existed. The auditors showed us how to check our multiplications by "casting out nines." This is done by inspecting all the *input* integers of multiplication, first crossing out any nines and then crossing out any combinations of integers that add to nine, exclusively *within* either the (a) multiplicands, (b) multipliers, or (c) products of multiplication, taken separately. This means we do not take combinations of integers occurring in other than their own respective (a), (b), or (c) sets of integers that add up to nine.

1222.32

(a) Multiplier	Cross out all nines,
(b) × Multiplicand	or any set of integers
------------------	adding to nine, in any
(c) Product	one of either the
	multiplier (a), the
	multiplicand (b), or
	the product (c).



1223.00 **Wave Pulsation of Indigs**

1223.10 **Pulsative Octave:** The interaction of all numbers other than nine creates the wave phenomenon described, i.e., the self-invertible, self-inside-outable octave increasing and decreasing pulsatively, fourfoldedly, and tetrahedrally. No matter how complex a number-aggregating sequence of events and conditions may be, this same number behavior phenomenon is all that ever happens. There is thus a primitively comprehensive, isotropically distributive, carrier-wave order omniaccommodatively permeating and embracing all phenomena. (See Sec. 1012.10)

1223.11 As the nine columns of Indig Table 2 show, I have integrated the digits of all the different multiplication systems and have always found the positively-negatively pulsative, octave, zero-nine-intervaled, ergo interference-free, carrier-wave pattern to be permeating all of them in four alternative interger-mix sequences; with again, four positively ordered and four negatively ordered sequence sets, all octavely ventilated by zero nines cyclically, ergo inherently, ergo eternally synchronized to non-inter- interferences.

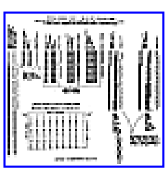


Fig. 1223.12

1223.12 As will also be seen in Indig Table 2, the integer carrier waves can pulse in single sets, as in Columns 1 and 8; in double pairs, as in Columns 4 and 5; in triple triplets, as in Columns 3 and 6; and in double quadruplets, as in Columns 2 and 7—always octavely interspersed with zeros and, in the case of Columns 3 and 6, interspersed with zeros triangularly as well as octavely. This also means that the omnidirectional wave interpermutatings are accommodated as points or as lines; or as triangular areas; or as tetrahedral volumes—both positive and negative.

1223.13 Thus we are informed that the carrier waves and their internal-external zero intervalling are congruent with the omnitriangulated, tetraplaned, four-dimensional vector equilibria and the omniregenerative isotropic matrix whose univectorings accommodate any wavelength or frequency multiplying in respect to any convergently-divergently nuclear system loci of Universe.

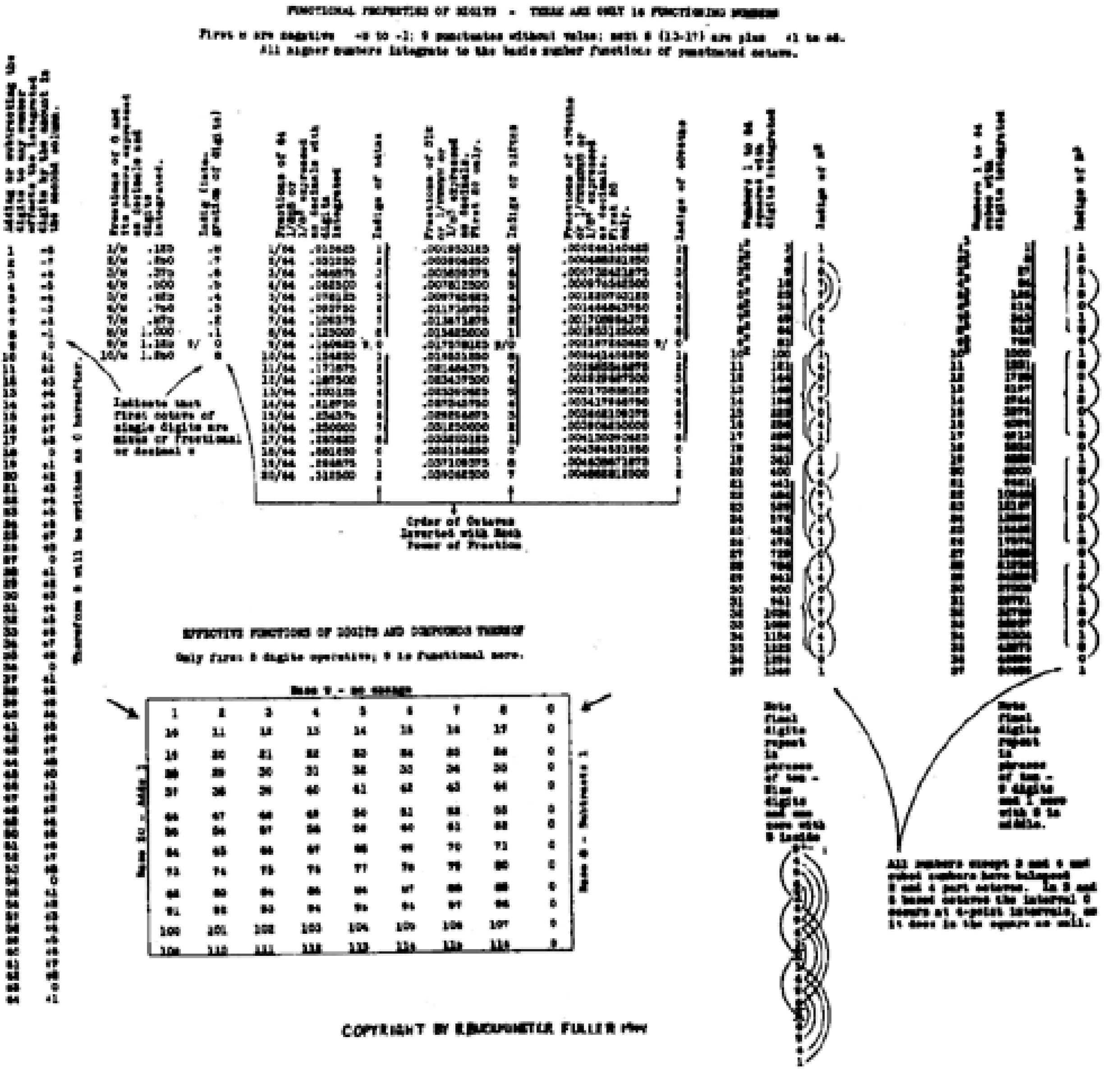


Fig. 1223.12.

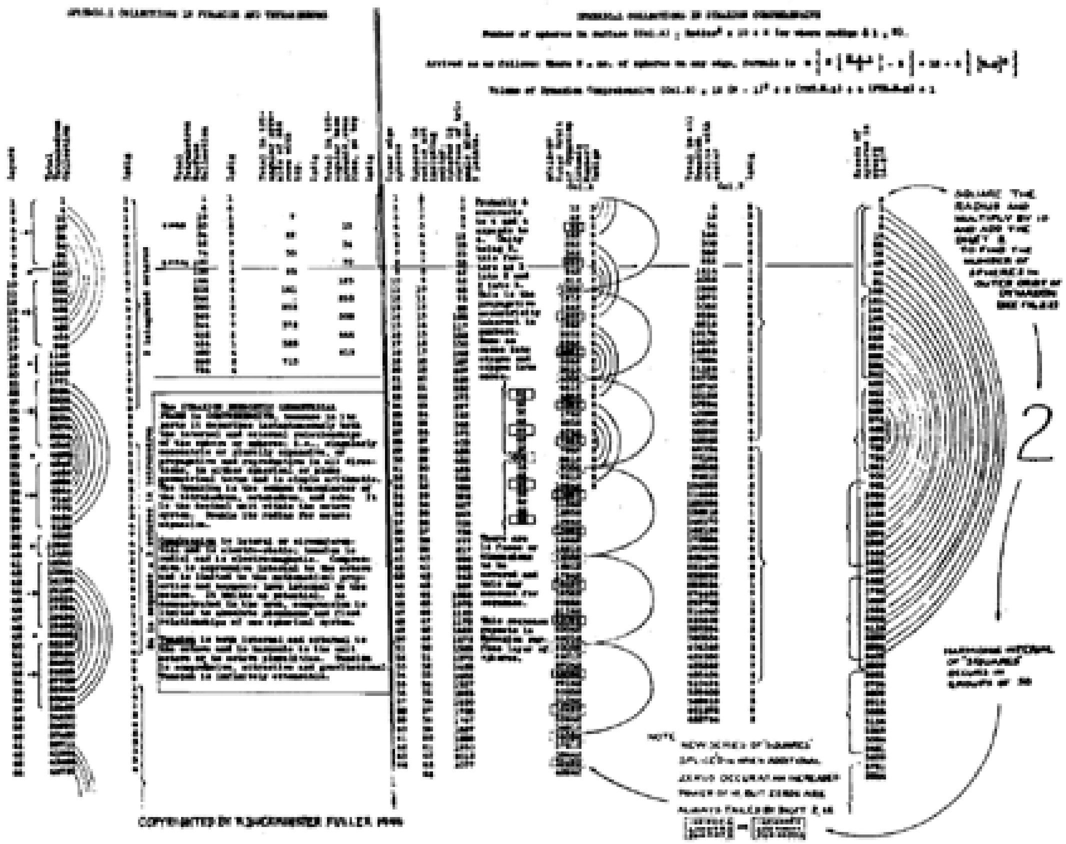


Fig. 1223.12b.

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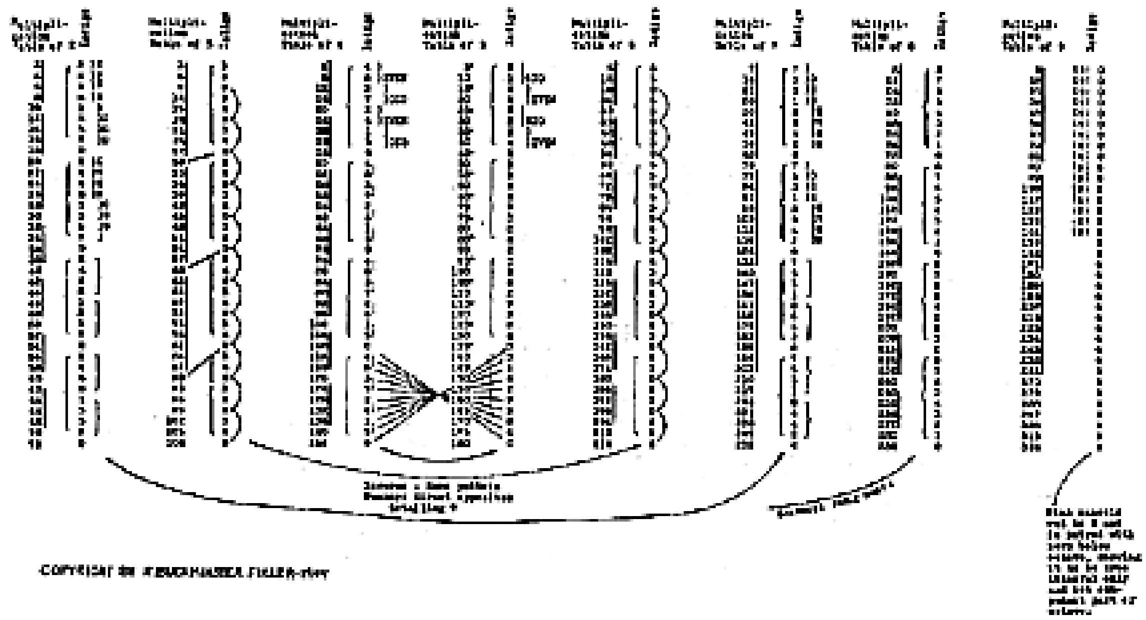

Fig. 1223.12c.

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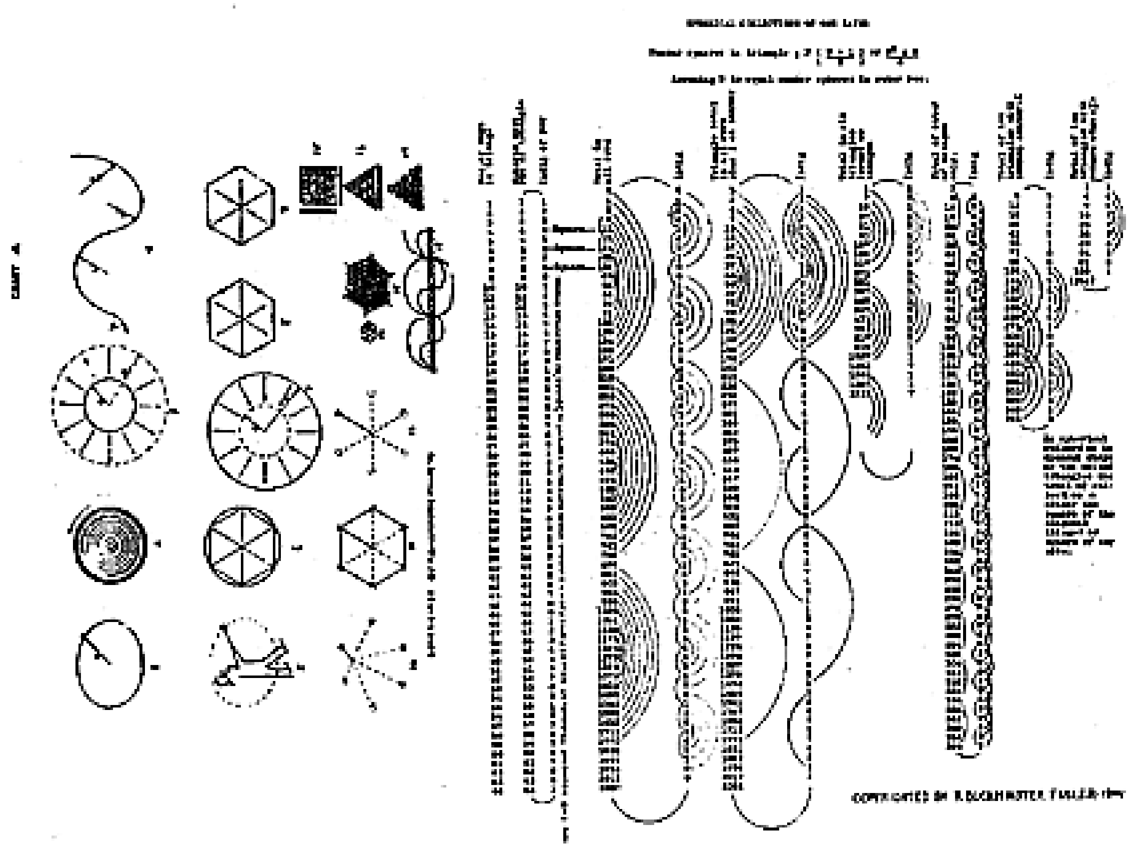


Fig. 1223.12d.

Click To Zoom In

1223.14 Not only is there an external zero intervalling between all the unique octave- patterning sets in every one of the four positive, four negative systems manifest, but we find also the wave-intermodulating indigs *within* each octave always integrating sum- totally internally to the octaves themselves as *nines*, which is again an internal zero content—this produces in effect a positive zero function vs. a negative zero function, i.e., an inside-out and outside-out zero as the ultracosmic zero-wave pulsativeness.[2]

(Footnote 2: See Sec. 1012, which describes a closest-sphere-packing model of the same phenomenon. If we make an X configuration with one ball in the center common to both triangles of the X, the ball at the intersection common to both represents the zero—or the place where the waves can pass through each other. The zero always accomodates when two waves come together. We know that atoms close-pack in this manner, and we know how wave phenomena such as radio waves behave. And now we have a model to explain how they do not interfere.)

1223.15 Thus we discover the modus operandi by which radio waves and other waves pass uninterferingly through seeming solids, which are themselves only wave complexes. The lack of interference is explained by the crossing of the high-frequency waves through the much lower-frequency waves at the noninterfering zero points, or indeed by the varifrequencied waves through both one another's internal and external zero intervals. (See Illus. 1012.13A and B.)

1223.16 If the readers would like to do some of their own indig exploration they may be instructively intrigued by taking a book of mathematical tables and turning to the table of second powers of integers. If they undertake to indig each of those successively listed second-power numbers they will discover that, for the first 100 numbers listed, a unique sequence of 24 integers will appear that peaks at 25, reverses itself, and bottoms at one, only to turn again and peak at 50, bottom at 75, and peak again at the 100th number which, when analyzed, manifests a $2 \times 2 \times 2 = 8 = 2^3 \times 3 = 24$ four-dimensional wave. This four-dimensional wave is only comprehendible when we discover (see Sec. 982.62) the three-frequency reality of $F^3 \times 2$ 1/2, 3, 4, 5, 6, the a priori, initially-volumed, ergo three-dimensional reality multiplied by the third power of omnidirectional growth rate.

1224.00 **Wave Pulsation of Number 24**

1224.10 **Vector Equilibrium and Octave Wave**

1224.11 The second powering of numbers apparently involves a 24-positive and 24- negative resonance phasing. The potential variables of the indigs of the second-powering of the 24 successive integers running between 0 and 25, and indigs of the 24 integers descending successively between 25 and 50, and repeating the 24 integers between 50 and 75, and the 24 integers between 75 and 100 ad infinitum, apparently account for all the equilibrious-disequilibrious, radiational-gravitational, convergent-divergent, curviwavilinear behaviors in respect to the vector equilibrium as well as for the unique rates of growth or contraction of closest-packed-spherical agglomerating.

1224.12 In respect to the progressive series of n2 product numbers as expressed in congruence-in-modulo- 10, a unique 24-integer series of terminal, submodulus-10, excess integers completes its series direction with 24 and makes its verse-and-reverse series at the common hinges of 25^2, 75^2, 100^2 in increments of +24, -24, +24, -24, or in a positively occurring, three-octave-wave increment sequence followed each time by a reversely occurring, three-octave-wave, unique harmonic theme.

1224.13 The three-octave, 24-integer series is manifest in the convergent-divergent, tetrahedral wave propagations of the vector equilibrium wherein the eight tetrahedra share their nuclear sphere and then share their common apex spheres as they embrace that nuclear sphere by expanding in successive triangular closest-packed sphere layers. (Compare Secs. 1012.11 and 1033.030.)

1224.14 The lines omniinterconnecting the sphere centers of those successively embracing layers produce equiangular triangles, or electromagnetic fields, the sum of whose areas in each successive layer is always n^2 of the number in each series in that layer. In contradistinction to the triangular field, in the series of triangularly closest-packed sphere layers, every two adjacent layers' series produces the next greater n^2 number of spheres, with the number of closest-packed sphere triangles in the waxing and waning phases of the series being governed by the frequency of the wave propagation elected for consideration in each instant.

1224.20 **Recapitulation**

1224.21 The interwave and intervolumetric behavior of the number 24 may be considered variously as follows:

- 24 A Quanta Modules per regular tetrahedron: (Tables 223.64 and 943.00; Secs. 910.11 and 942.10)
- 24 modules of regular tetrahedron as cosmic bridge between equilibrious prime number one of metaphysics and disequilibrious prime number one of physical reality (Sec. 954.51)
- B Quanta Modules per Coupler (asymmetric octahedron): (Table 223.64; Secs. 954.10, 954.21, and 954.46)
- 24 subparticle differentiabilities of the Coupler to provide for the 2, 3, 4, 6 combinations of proton-neutron intertransformabilities and isotopic variations: (Sec. 954.22)
- 24 positive and negative basic triangles (basic equilibrium 48 LCD triangles) defined by the 25 great circles of the vector equilibrium: (Secs. 453.01 and 1052.30)
- 24 total exterior vertexes of the vector equilibrium paired to produce 12 congruent, univalent external vertexes and to describe the eight tetrahedra, all of which share a common nuclear point to function in octavalent congruence as nuclear circuitry: (Secs. 1012.11 and 1033.030)
- 24 positively integrated vectors as the implosive, external, circumferentially embracing set of the four great circles of the vector equilibrium and the 24 negatively disintegrative, internal, radially explosive set, with both sets paired at the 12 vertexes: Secs. 450.11, 537.131, 615.06, 905.55, 955.02, 1011.40, and 1052.30)
- 24 interior and exterior A Quanta Modules of the isosceles dodecahedron: (Table 943.00)
- 24 A-and-B-Quanta-Module-volume of the nucleus-embracing cube formed by applying the eight Eighth-Octahedra to the eight triangular facets of the vector equilibrium: Secs. 905.44 and 982.62)
- 24 spherical right triangles of the spherical tetrahedron's three-way great-circle grid: (Sec. 905.51)
- 24 highest common multiple of regular-tetrahedral-volume values of all congruently symmetric polyhedra of the hierarchy of concentric, symmetrical, rationally volumed geometries occurring within the isotropic vector matrix: (Sec. 982.70)
- 24 integer series of alternately convergent-divergent sequences with 24 unique terminal suffix excesses—in respect to the series of n2 numbers as expressed by congruence in modulo-10—which series peaks at 24 and commonly hinges at 25 to reverse descendingly again to hinge at 50 and then ascends to peak again to hinge at 75 and repeats, in this unique, three-octave, convergent-divergent, wave pulsating- propagating of harmonic themes mutingly inflected at the 25th hinge: (Sec. 1223.16)
- The 24 A or B Quanta Modules per 120 basic disequilibrium LCD triangles: (sec. 1053.36)
- The inherent subdivision of any tetrahedron, regular or irregular, into 24 equal modules: Sec. 961.44)
- The cosmic hierarchy limit of 24 active tetravolumes per each sphere-into-space and each space-into-sphere intertransforming of the complex of jitterbugs: (Sec. 1033.20)
- The 24 S Quanta Modules of the icosa-octa interrelationship within the four- frequency tetrahedron: (Sec. 988)
- The five sets of 24 each of the T or E Quanta Modules of the rhombic triacontahedron.

1224.30 **Turnaround Terminals**

1224.31 The powerful 24-ness number behavior with its great-circle congruences and three-octave harmonics may have significant ramifications embracing the unique frequencies of the chemical compoundings as well as the nuclear geometry elucidated elsewhere in this work. (Sec. 1033 *passim.*) The terminal-suffix excess integers of the series of second powers of numbers as expressed in congruence in modulo-10 displays the sequence of uniquely aberrating eccentricities in respect to the whole 24-integer phrases.

1224.32 The large figure "2"' in the last column of the Indig Table (Fig. 1223.12B) shows that the terminal digits of the second powers of numbers turn around at the middling number 25.

1224.33 There are 24 positive and 24 negative unique numbers that reverse themselves between 0 and 50. This reflects three positive and three negative octaves with turnaround terminal zero accommodation.

1224.34 The "square" identifies that number of energy units occurring in the outer shell of all nuclear phenomena with the second-powering characteristic being that of both the gravitation and the radiational constant's surface growth.

1230.00 **Scheherazade Numbers**

1230.10 Prime-Number Accommodation: Integration of Seven: The Babylonians did not accommodate a prime number like 7 in their mathematics. Plato had apparently been excited by this deficiency, so he multiplied 360 by 7 and obtained 2,520. And then, seeing that there were always positives and negatives, he multiplied 2,520 by 2 and obtained 5,040. Plato apparently intuited the significance of the number 5,040, but he did not say why he did. I am sure he was trying to integrate 7 to evolve a comprehensively rational circular dividend.

1230.11 H_2O is a simple low number. As both chemistry and quantum physics show, nature does all her associating and disassociating in whole rational numbers. Humans accommodated the primes 1, 2, 3, and 5 in the decimal and duodecimal systems. But they left out 7. After 7, the next two primes are 11 and 13 . Humans' superstition considers the numbers 7, 11, and 13 to be bad luck. In playing dice, 7 and 11 are "crapping" or drop-out numbers. And 13 is awful. But so long as the comprehensive cyclic dividend fails to contain prime numbers which may occur in the data to be coped with, irrational numbers will build up or erode the processing numbers to produce irrational, ergo unnatural, results. We must therefore realize that the tables of the trigonometric functions include the first 15 primes 1, 2, 3, 5, 7, 11, 13, 17, 19, 23,29,31,41,43.

1230.12 We know 7 × 11 is 77. If we multiply 77 by 13, we get 1,001. Were there not 1,001 Tales of the Arabian Nights? We find these numbers always involved with the mystical. The number 1,001 majors in the name of the storytelling done by Scheherazade to postpone her death in the *Thousand and One Nights.* The number 1,001 is a binomial reflection pattern: one, zero, zero, one.

1230.20 **SSRCD Numbers:** If we multiply the first four primes, we get 30. If we multiply 30 times 7, 11, and 13, we have 30 × 1,001 or 30,030, and we have used the first seven primes.

1230.21 We can be intuitive about the eighth prime since the octave seems to be so important. The eighth prime is 17, and if we multiply 30,030 by 17, we arrive at a fantastically simple number: 510,510. This is what I call an SSRCD Number, which stands for *Scheherazade Sublimely Rememberable Comprehensive Dividend.* As an example we can readily remember the first eight primes factorial—510,510! (Factorial means successively multiplied by themselves, ergo 1 × 2 × 3 × 5 × 7 × 11 × 13 × 17= 510,510.)

1230.30 **Origin of Scheherazade Myth:** I think the Arabian priest-mathematicians and their Indian Ocean navigator ancestors knew that the binomial effect of 1,001 upon the first four prime numbers 1, 2, 3, and 5 did indeed provide comprehensive dividend accommodation of all the permutative possibilities of all the "story-telling-taling-tallying," or computational systems of the octave system of integers.

1230.31 The function of the grand vizier to the ruler was that of mathematical wizard, the wiz of wiz-dom; and the wiz-ard kept secret to himself the mathematical navigational ability to go to faraway strange places where he alone knew there existed physical resources different from any of those occurring "at home," then voyaging to places that only the navigator-priest knew how to reach, he was able to bring back guaranteed strange objects that were exhibited by the ruler to his people as miracles obviously producible only by the ruler who secretly and carefully guarded his vizier's miraculous power of wiz-dom.

1230.32 To guarantee their own security and advantage, the Mesopotamian mathematicians, who were the overland-and-overseas navigator-priests, deliberately hid their knowledge, their mathematical tools and operational principles such as the mathematical significance of $7 \times 11 \times 13 = 1{,}001$ from both their rulers and the people. They used psychology as well as outright lies, combining the bad-luck myth of the three prime integers with the mysterious inclusiveness of the *Thousand and One Nights.* The priests warned that bad luck would befall anyone caught using 7s, 11s, or 13s.

1230.33 Some calculation could only be done by the abacus or by positioning numbers. With almost no one other than the high priests able to do any calculation, there was not much chance that anyone would discover that the product of 7, 11, and 13 is 001, but "just in case," they developed the diverting myth of Scheherazade and her postponement of execution by her *Thousand and One Nights.*

Next Section: 1231.00

1231.00 **Cosmic Illions**

1231.01 Western-world humans are no longer spontaneously cognizant of the Greek or Latin number prefixes like *dec*-, or *non*-, or *oct*-, nor are they able spontaneously to formulate in appropriate Latin or Greek terms the larger numbers spoken of by scientists nowadays only as *powers of ten.* On the other hand, we are indeed familiar with the Anglo-American words *one*, *two,* and *three,* wherefore we may prefix these more familiar designations to the constant *illion*, suffix which we will now always equate with a set of three successive zeros. (See Table 1238.80.)

1231.02 We used to call 1,000 *one thousand.* We will now call it *oneillion.* Each additional set of three zeros is recognized by the prefixed number of such three-zero sets. 1,000,000= two-illion. 1,000,000,000 is 1 threeillion. (This is always hyphenated to avoid confusion with the set of subillion enumerators, e.g., 206 four-illions.) The English identified illions only with six zero additions, while the Americans used illions for every three zeros, starting, however, only *after 1,000,* overlooking its three zeros as common to all of them. Both the English and American systems thus were forced to use awkward nomenclature by retaining the initial word *thousand* as belonging to a different concept and an historically earlier time. Using our consistent illion nomenclature, we express the largest experientially conceivable measurement, which is the diameter of the thus-far- observed Universe measured in diameters of the nucleus of the atom, which measurement is a neat 312 fourteenillions. (See Sec. 1238.50.)

1232.00 **Binomial Symmetry of Scheherazade Numbers**

1232.10 **Exponential Powers of 1,001:** As with all binomials, for example A2 + 2AB +B2, the progressive powers of the 1,001 Scheherazade Number produced by 7 × 11 × the product of which, multiplied by itself in successive stages, provides a series of symmetrical reflection numbers. They are not only sublimely rememberable but they resolve themselves into a symmetrical mirror pyramid array:

1001^2 = 1,00**2**,001

1001^3 = 1,00**3**,00**3**,001

1001^4 = 1,00**4**,006,00**4**,001

1001^5 = 1,00**5**,010,010,00**5**,001

1001^6 = 1,00**6**,015,020,015,00**6**,001

1001^7 = 1,00**7**,021,035,035,021,00**7**,001

1001^8 = 1,00**8**,028,056,070,056,028,00**8**,001

1001^9 = 1,00**9**,036,084,126,126,084,036,00**9**,001

1001^{10} = 1,0**10**,045,120,210,252,210,120,045,0**10**,001

1232.11 The binomial symmetry expands all of its multiples in both left and right directions in reflection balance. Note that the exponential power to which the 1,001 Scheherazade Number is raised becomes the second whole integer from either end. As with $(A+B)^2 = A^2 + 2AB + B^2$, the interior integers consist of expressions and products of the exponent power.

1232.20 **Cancellation of "Leftward Spillover":** In the pyramid array of 1,001 Scheherazade Numbers (see Sec. 1232.10), we observe that *due to the double-symbol notation of the number 10,* the symmetry seems to be altered by the introduction of the leftward accommodation of the two integers of 10 in a single-integer position. For instance,

$$1001^5 = 1\ ,005\ ,010\ ,010\ ,005\ ,001$$

10 10

$$1001^5 = 1\ ,005\ ,000\ ,000\ ,005\ ,001$$

1 1

$$1001^5 = 1\ ,005\ ,000\ ,000\ ,005\ ,001$$

Ten could be written vertically as

1

0

instead of 10, provided we always assumed that the vertically superimposed integer was to be spilled into the addition of the next leftward column, for we build leftward positively and rightward negatively from our decimal *zero-zero.*

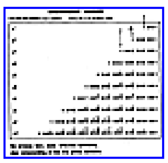


Table 1232.21

1232.21 The abacus with its wires and beads taught humans how to fill a column with figures and thereafter to fill additional columns, by convention to the left. The Arabic numerals developed as symbols for the content of the columns. They filled a column and then they emptied it, but the cipher prevented them from using the column for any other notation, and the excess—by convention—was moved over to the left. This "spillover" can begin earlier or later, depending on the modulus employed. The spillover to the next column begins later when we are employing Modulo 12 than when we are employing Modulo 10. To disembarrass the symmetry of the leftward spillover, the spillover number in the table has been written vertically.

1232.22 The table of the ten successive powers of the 1,001 Scheherazade Number accidentally discloses a series of progressions:

(1) in the extreme right-hand column, a progression of zeros;

(2) in the fourth column from the right, an arithmetical progression of

$$\frac{N^2 - N}{2},$$

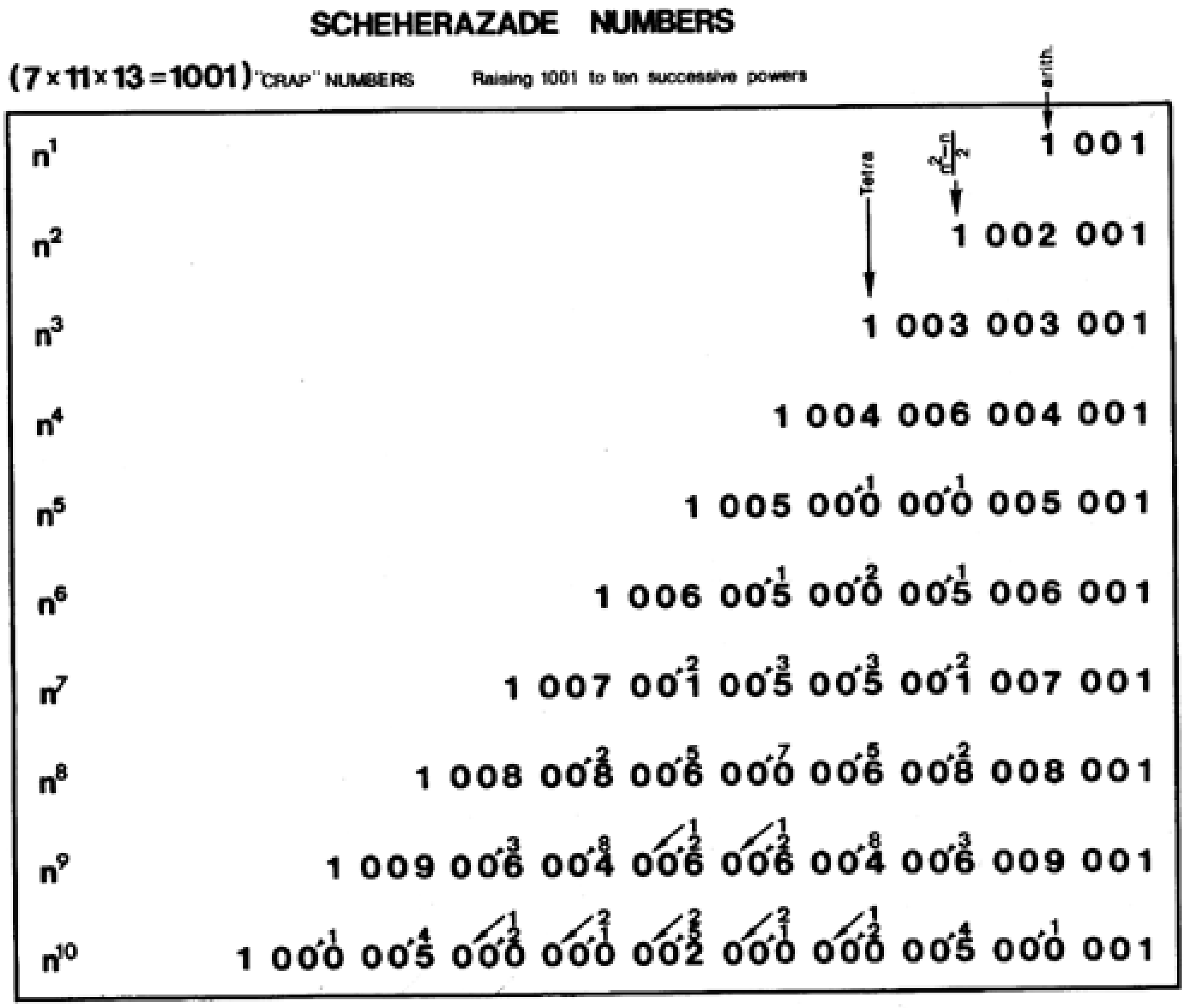
which we will call triangular; and

(3) in the seventh column from the right, a tetrahedral progression.

1232.23 The tetrahedron can be symmetrically or asymmetrically altered to accommodate the four unique planes that produce the fourth-dimensional accommodation of the vector equilibrium. The symmetry disclosed here may very well be four-dimensional symmetry that we have simply expressed in columns in a plane.

1232.24 The number 1,001 looks exciting because we are very close to the binary system of the computers. (We remember that Polynesians only counted to one and two.) The binary yes-no sequence looks so familiar. The Scheherazade Number has all the numbers you have in the binary system. The l,001-ness keeps persisting throughout the table.

1232.25 The numbers 7 × 11 × 13 × 17 included in the symmetric dividend 510,510 may have an important function in atomic nucleation, since it accommodates all the prime numbers involved in the successive periods.


SCHEHERAZADE NUMBERS

(7 × 11 × 13 = 1001) "CRAP" NUMBERS Raising 1001 to ten successive powers

n^1	1 001
n^2	1 002 001
n^3	1 003 003 001
n^4	1 004 006 004 001
n^5	1 005 000 000 005 001
n^6	1 006 005 000 005 006 001
n^7	1 007 001 005 005 001 007 001
n^8	1 008 008 006 000 006 008 008 001
n^9	1 009 006 004 006 006 004 006 009 001
n^{10}	1 000 005 000 000 002 000 000 005 000 001

We witness here, basic reflective symmetry, plus compounding of first five prime numbers.

Table 1232.21 Cancellation of "Leftward Spillover" to Disclose Basic Reflection Symmetry of Successive Powers of the Scheherazade Numbers: Raising 1001 to ten successive powers, we recognize basic reflective symmetry plus compounding of five basic primes. 7 × 11 × 13 = 1001.

1232.26 Many mathematicians assume that the integer 1 is not to be counted as a prime. Thus 2, 3, 5, 7, 11, and 13 make a total of six effective primes that may be identified with the fundamental vector edges of the tetrahedron and the six axes of conglomeration of 12 uniradius spheres closest packed around one nuclear sphere, and the fundamental topological abundance of universal lines that always consist of even sets of six.

1232.30 **Scheherazade Reflection Patterns:**

$1 \cdot 2 \cdot 3 \cdot 5$	30
$7 \cdot 11 \cdot 13$	1,001
$1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13$	30,030
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^2$	901,800,900
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^2 \cdot 5$	4,509,004,500
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^3$	27,081,081,027,000
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^3 \cdot 9$	243,729,729,243,000
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^4$	813,244,863,240,810,000
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^4 \cdot 3$	2,439,734,589,722,430,000
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^5$	24,421,743,243,121,524,300,000
$1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17$	510,510
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17)^2$	260,620,460,100
$1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17 \cdot 19$	9,699,690
$1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17 \cdot 19 \cdot 23 \cdot 29$	6,469,693,230
$1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17 \cdot 19 \cdot 23 \cdot 29 \cdot 31$	200,560,490,130
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13) \cdot (1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17)$	153,306,153
$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13) \cdot (1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13 \cdot 17)^2$	459,918,459

1234.00 **Seven-illion Scheherazade Number**

1234.01 The Seven-illion Scheherazade Number includes the first seven primes, which are:

$(1 \cdot 2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)^5$ ... to the fifth power.

It reads,

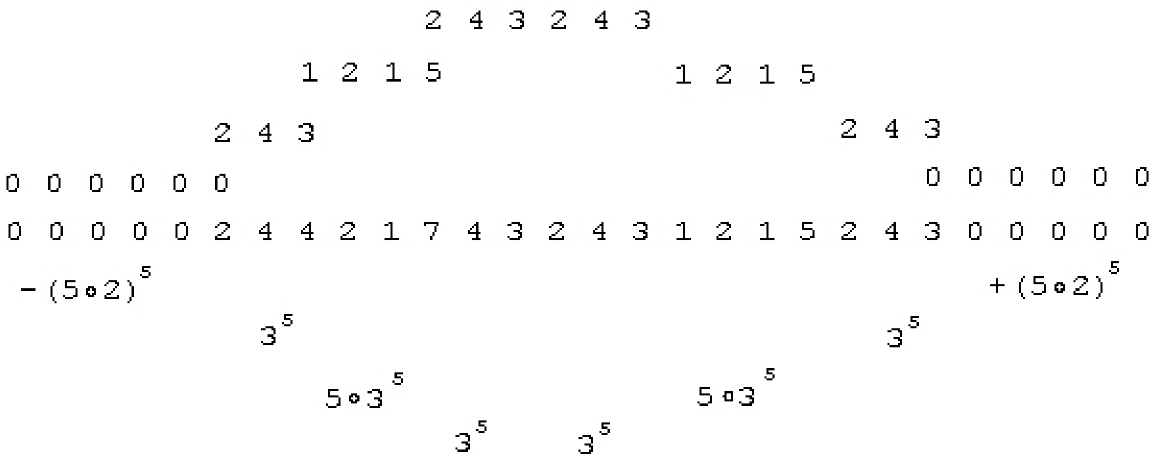
24,421,743,243,121,524,300,000

1234.02 In the first days of electromagnetics, scientists discovered fourth-power energy relationships and Einstein began to find fifth-power relationships having to do with gravity accommodating fourth- and fifth-powering. The first seven primes factorial is a sublimely rememberable number. It is a big number, yet rememberable. When nature gives us a number we can remember, she is putting us on notice that the cosmic communications circuits are open: you are connected through to many sublime truths!

1234.03 Though factored by seven prime numbers, it is expressible entirely as various-sized increments of three to the fifth power. There is a four-place overlapping of one. Three to the fifth power means five-dimensionality triangulation, which means that five-dimensional structuring as triangulation is structure.

1234.04 When it is substituted as a comprehensive dividend for 360° 00' 00" to express cyclic unity in increments equal to one second of arc, while recalculating the tables of trigonometric functions, it is probable that *many,* if not *most,* and possibly *all* the function fractions will be expressible as whole rational numbers. The use of 24,421,743,243,121,524,300,000 as cyclic unity will eliminate much cumulative error of the present trigonometric-function tables.

1234.10 **Seven-illion Scheherazade Number: Symmetrical Mirror Pyramid Array**



where 3^5 = 243, $5\cdot3^5$ = 1215, $-(5\cdot2)^5$ = five zero prefix, + $(5\cdot2)^5$ = five zero sufix

1236.00 **Eight-illion Scheherazade Number**

1236.01 The Eight-illion Scheherazade Number is

$1\cdot2\cdot3\cdot5\cdot7\cdot11\cdot13$

$1\cdot2\cdot3\cdot5\cdot7\cdot11\cdot13\cdot17$

$1\cdot2\cdot3\cdot5\cdot7\cdot11\cdot13\cdot17\cdot19\cdot23\cdot29\cdot31$

Which is:

$1^n\cdot2^3\cdot3^8\cdot5^5\cdot7^4\cdot11^3\cdot13^3\cdot17^2\cdot19\cdot23\cdot29\cdot31$

It reads:

1,452,803,177,020,770,377,302,500

1236.02 The Eight-illion Scheherazade Number accommodates all trigonometric functions, spherical and planar, when unity is 60 degrees; its halfway turnabout is 30 degrees. It also accommodates the octave-nine-zero of the icosahedron's corner angles of 72 degrees, one-half of which is 36 degrees (ergo, 31 is the greatest prime involved), which characterizes maximum spherical excess of the vector equilibrium's sixty- degreeness.

1237.00 **Nine-illion Scheherazade Number**

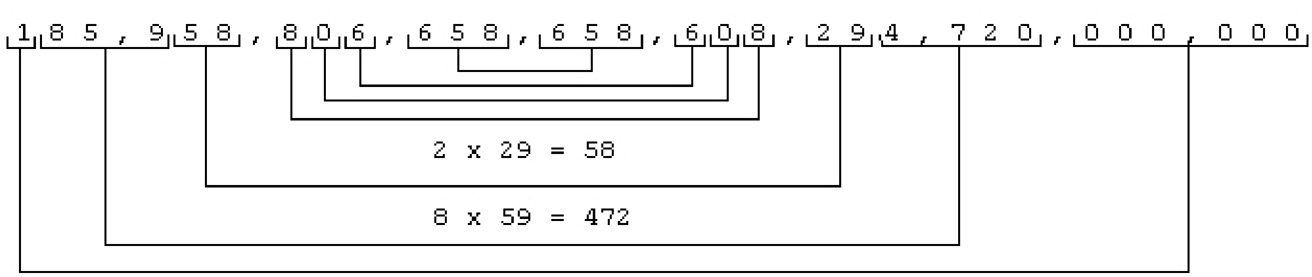
1237.01 The Nine-illion Scheherazade Number includes the first 12 primes, which are:

$$1^n\cdot2^{10}\cdot3^8\cdot5^8\cdot7^4\cdot11^3\cdot13^3\cdot17^2\cdot19\cdot23\cdot29\cdot31$$

It reads:

185,958,806,658,658,608,294,720,000,000

It is full of mirrors:



1238.00 **Fourteen-illion Scheherazade Number**

1238.20 **Trigonometric Limit: First 14 Primes:** The Fourteen-illion Scheherazade Number accommodates all the omnirational calculations of the trigonometric function tables whose largest prime number is 43 and whose highest common variable multiple is 45 degrees, which is one-eighth of unity in a Universe whose polyhedral systems consist always of a minimum of four positive and four negative quadranted hemispheres.

1238.21 45 degrees is the zero limit of covarying asymmetry because the right triangle's 90-degree corner is always complemented by two corners always together totalling 90 degrees. The smallest of the covarying, 90-degree complementaries reaches its maximum limit when both complementaries are 45 degrees. Accepting the concept that one is not a prime number, we have 14 primes—2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43—which primacy will accommodate all the 14 unique structural faceting of all the crystallography, all the biological cell structuring, and all bubble agglomerating: the 14 facets being the polar facets of the seven and only seven axes of symmetry of Universe, which are the 3-, 4-, 6-, 12-great circles of the vector equilibrium and the 6-, 10-, 15-great circles of the icosahedron.

1238.22 **Tetrahedral Complementations** The sphere-to-space, space-to-sphere intertransformability is a conceptual generalization holding true independent of size, which therefore permits us to consider the generalized allspace-filling complementarity of the convex (sphere) and concave (space) octahedra with the convex (sphere) and concave (space) vector equilibria; this also permits us to indulge our concentrated attention upon local special-case events without fear of missing further opportunities of enjoying total synergetically conceptual advantage regarding nonsimultaneously considerable Scenario Universe. (See Secs. 970.20 and 1032.)

1238.23 We know the fundamental intercomplementations of the external convex macrotetra and the internal concave microtetra with all conceptual systems. Looking at the four successive plus, minus, plus, minus, XYZ coordination quadrants, we find that a single 90-degree quadrant of one hemisphere of the spherical octahedron contains all the trigonometric functioning covariations of the whole system. When the central angle is 90 degrees, then the two small corner angles of the isosceles triangle are each 45 degrees. After 45 degrees the sines become cosines, and vice versa. At 45 degrees they balance. Thereafter all the prime numbers that can ever enter into prime trigonometric computation (in contradistinction to *complementary* function computation) occur below the number 45. What occasions irrationality is the inability of dividends to be omni-equi-divisible, due to the presence of a prime number of which the dividend is not a whole product.

1238.24 This is why we factor completely or intermultiply all of the first 14 prime numbers existing between 1 and 45 degrees. Inclusive of these 14 numbers we multiply the first eight primes to many repowerings, which produces this Scheherazade Number, which, when used as the number of units in a circle, becomes a dividend permitting omnirational computation accommodation of all the variations of all the trigonometries of Universe.

1238.25 The four vertexial stars A, B, C, D defining the minimum structural—ergo, triangulated—system of Universe have only four possible triangular arrangements. There are only four possible different topological vertex combinations of a minimum structural system: ABC, ABD, ACD, BCD. In multifrequenced, modular subdivisioning of the minimum structural system, the subdividing grid may develop eight positive and negative aspects:

ABC obverse (convex)	ABC reverse (concave)
ABD obverse (convex)	ABD reverse (concave)
ACD obverse (convex)	ACD reverse (concave)
BCD obverse (convex)	BCD reverse (concave)

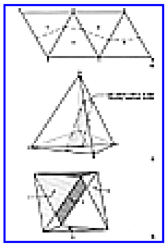


Fig. 1238.26

1238.26 Three unopened edges AB, AD, BC. (Fig. 1238.26A.)

Four edge-bonded triangles of the tetrahedron. (Fig. 1238.26B.)

Three pairs of opened edges; three pairs of unopened edges. Each triangle has also both obverse and reverse surfaces; ergo, minimum closed system of Universe has four positive and four negative triangles—which equals eight cases of the same.

The same four triangles vertex-bond to produce the octahedron. (Fig. 1238.26C.)

1238.27 In a spherically referenced symmetrical structural system one quadrant of one hemisphere contains all the trigonometric variables of the whole system. This is because each hemisphere constitutes a 360-degree encirclement of its pole and because a 90-degree quadrant is represented by three equi-right-angle surface-angle corners and three equi-90-degree central-angle-arc edges, half of which 90-degree surface and central angles is 45 degrees, which is the point where the sine of one angle becomes the cosine of the other and knowledge of the smallest is adequate—ergo, 45° 45° is the limit case of the smallest.

1238.28 Spherical Quadrant Phase: There is always a total of eight (four positive, four negative) unique

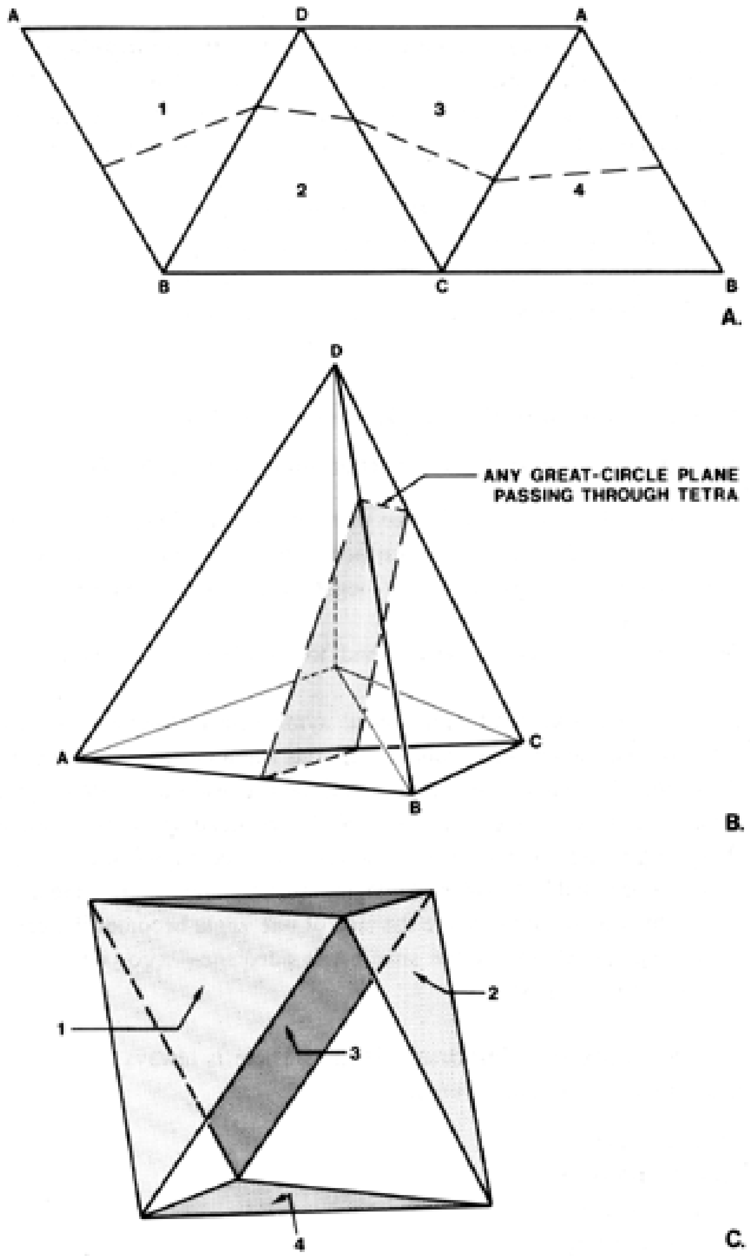
interpermutative,
intertransformative,
interequatable,
omniembracing

phases of all cyclically described symmetrical systems (see Sec. 610.20), within any one octave of which all the intercovariable ranging complementations of number occur. For instance, in a system such as spherical trigonometry, consisting of 360 degrees per circle or cycle, all the numerical intervariabilities occur within the first 45 degrees, .: 45 × 8 = 360. Since the unit cyclic totality of the Fourteen-illion Scheherazade Number is the product of the first 15 primes, it contains all the prime numbers occurring within the 45- degree-limit numerical integer permutations of all cyclic systems together with an abundance of powers of the first eight primes, thus accommodating omnirational integrational expressibility to a 1×10^{-42} fraction of cyclic unity, a dividend so comprehensive as to permit the rational description of a 22 billion-light-year-diameter Universe in whole increments of 1/10,000ths of one atomic nucleus diameter.

1238.29

(+)·(+)=(+)	
(+)·(-)=(-)	Multiply
(-)·(+)=(-)	
(-)·(-)=(+)	

(+)/(+)=(+)	
(+)/(-)=(-)	Divide
(-)/(+)=(-)	
(-)/(-)=(+)	



Figs. 1238.26A. B, C: In this plane net of four hinged triangles the dotted line indicates the intersection of a great-circle plane passing through the assembled tetra.

Four edge-bonded triangles of the tetra with great-circle plane passing through.

The same four triangles may be vertex-bonded to describe an octahedron with alternate open and closed faces.

Next Section: 1238.30

1238.30 **Cosmic Commensurability of Time and Size Magnitudes:** Each degree of 360 degrees of circular arc is subdivided into 60 minutes and the minutes into 60 seconds each. There are 1,296,000 seconds of arc in a circle of 360 degrees.

1238.31 One minute of our 8,000-mile-diameter planet Earth's great circle arc = one nautical mile = 6,076 feet approximately. A one-second arc of a great circle of Earth is 6,076/60 = 101.26 feet, which means one second of great-circle arc around Earth is approximately 100 feet, or the length of one tennis court, or one-third of the distance between the opposing teams' goal posts on a football field. We can say that each second of Earth's great circle of arc equals approximately 1,200 inches (or 1,215.12 "exact"). There are 2 1/2 trillion atomic-nucleus diameters in one inch. A hundredth of an inch is the smallest interval clearly discernible by the human eye. There are 25 billion atomic-nucleus diameters in the smallest humanly visible "distance" or linear size increment. A hundredth of an inch equals 1/120,000th of a second of great-circle arc of our spherical planet Earth. This is expressed decimally as .0000083 of a second of great-circle arc = .01 inch; or it is expressed scientifically as .01 inch = 83×10^{-7}. A hundredth of an inch equals the smallest humanly visible dust speck; therefore: minimum dust speck = 83×10^{-7} seconds of arc, which equals 25 billion atomic-nucleus diameters—or 2 1/2 million angstroms. This is to say that it requires seven places to the right of the decimal to express the fractional second of the greatcircle arc of Earth that is minimally discernible by the human eye.

1238.40 **Fourteen-illion Scheherazade Number:** The Fourteen-illion Scheherazade Number includes the first 15 primes, which are:

$$1^n \cdot 2^{12} \cdot 3^8 \cdot 5^6 \cdot 7^6 \cdot 11^6 \cdot 13^6 \cdot 17^2 \cdot 19 \cdot 23 \cdot 29 \cdot 31 \cdot 37 \cdot 41 \cdot 43$$

It reads:

3,128,581,583,194,999,609,732,086,426,156,130,368,000,000

1238.41 **Declining Powers of Factorial Primes:** The recurrence of the prime number 2 is very frequent. The number of operational occasions in which we need the prime number 43 is very less frequent than the occasions in which the prime numbers 2, 3, 5, 7, and 11 occur. This Scheherazade Number provides an abundance of repowerings of the lesser prime numbers characterizing the topological and vectorial aspects of synergetics' hierarchy of prime systems and their seven prime unique symmetrical aspects (see Sec. 1040) adequate to take care of all the topological and trigonometric computations and permutations governing all the associations and disassociations of the atoms.

1238.42 We find that we can get along without multirepowerings after the second repowering of the prime number 17. The prime number 17 is all that is needed to accommodate both the positive and negative octave systems and their additional zero- nineness. You have to have the zero-nine to accommodate the noninterfered passage between octave waves by waves of the same frequency. (See Secs. 1012 and 1223.)

1238.43 The prime number 17 accommodates all the positive-negative, quanta-wave primes up to and including the number 18, which in turn accommodates the two nines of the invisible twoness of all systems. It is to be noted that the harmonics of the periodic table of the elements add up to 92:

2	
8	18
8	
18	
18	
18	
18	36
2	

92	

There are five sets of 18, though the 36 is not always so recognized. Conventional analysis of the periodic table omits from its quanta accounting the always occurring invisible additive twoness of the poles of axial rotation of all systems.

(See Sec. 223.11 and Table 223.64, Col. 7.)

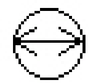
1238.50 **Properties:** The 3 fourteen-illion magnitude Scheherazade Number has 3×10^{43} whole-number places, which is 10^{37} more integer places than has the 1×10^{6} number expressing the 1,296,000 seconds in 360 degrees of whole-circle arc, and can therefore accommodate rationally not only calculations to approximately 1/l00th of an inch (which is the finest increment resolvable by the human eye), but also the 10^{-7} power of that minimally visible magnitude, for this 3×10^{43} SSRCD has enough decimal places to express rationally the 22-billion-light-years-diameter of the omnidirectional, celestial-sphere limits thus far observed by planet Earth's humans expressed in linear units measuring only l,000ths of the diameter of one atomic nucleus.

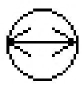
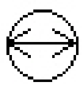
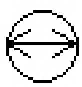
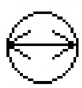
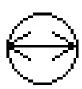
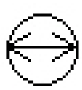
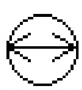
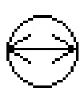
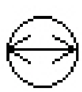
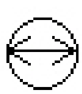
1238.51 **Scheherazade Numbers: 47:** The first prime number beyond the trigonometric limit is 47. The number 47 may be a flying increment to fill allspace, to fill out the eight triangular facets of the non-allspace-filling vector equilibrium to form the allspace-filling first nuclear cube. If 47 as a factor produces a Scheherazade Number with mirrors, it may account not only for all the specks of dust in the Universe but for all the changes of cosmic restlessness, accounting the convergent-divergent *next event,* which unbalances the even and rational whole numbers. If 47 as a factor does not produce a Scheherazade Number with mirrors, it may explain that there can be no recurring limit symmetries. It may be that 47 is the cosmic random element, the agent of infinite change.

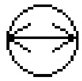
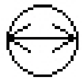
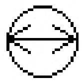
1238.52 **Addendum Inspired by inferences of Secs. 1223.12, 1224.30-34 inclusive and 1238.51**, just before going to press with *Synergetics* 2, we obtained the following 71 integer, multi-intermirrored, computer-calculated and proven, volumetric (third power) Scheherazade number which we have arranged in ten, "sublimely rememberable," unique characteristic rows. $2^{12}\cdot3^{8}\cdot5^{6}\cdot7^{6}\cdot$ $11^{6}\cdot13^{6}\cdot17^{4}\cdot19^{3}\cdot$ $23^{3}\cdot29^{3}\cdot31^{3}\cdot37^{3}\cdot$ 41^{3}·$43^{3}\cdot47^{3}$ the product of which is
616,494,535,0,868
49,2,48,0
51,88
27,49,49
00,6996,185
494,27,898
35,17,0
25,22,

73,66,0
864,000,000
If all the trigonometric functions are reworked using this 71 integer number, embracing all prime numbers to 50, to the third power, employed as volumetric, cyclic unity, all functions will prove to be whole rational numbers as with the whole atomic populations.

1238.60 **Size Magnitudes**

An Atomic Nucleus Diameter = A.N.D. = 

			Atomic Nucleus Diameters:
10,000		= 1 Angstrom (One atomic diameter)	= 10 one-illion
$1 \cdot 10^{4}$		= 1 Angstrom	= 10 one-illion
$25 \cdot 10^{9}$		= 1 Speck of Dust (= One hair's breadth)	= 25 three-illion
$25 \cdot 10^{11}$		= 1 Inch	= 2 1/2 four-illion
3ù10^{13}		= 1 Foot	= 30 four-illion
$1 \cdot 10^{14}$		= 1 Meter	= 100 four-illion
$10 \cdot 10^{16}$		= 1 Kilometer	= 100 five-illion
$18 \cdot 10^{16}$		= 1 Mile (Nautical)	= 180 five-illion
$144 \cdot 10^{19}$		= 1 Diameter of Earth	= 1.44 seven-illion
$144 \cdot 10^{21}$		= 1 Diameter of Sun	= 144 seven-illion

$144 \cdot 10^{25}$		=	1 Diameter of Solar System	= 1 1/2 nine-illion
$108 \cdot 10^{28}$		=	1 Light Year (6 trillion miles)	= 1 ten-illion
$2\ 1/3 \cdot 10^{40}$		=	Diameter of astro observed sweepout (22 billion light years)	= 23 thirteen-illion

1238.70

$1 \cdot 10^{6}$	=	1 million	=	1 two-illion heartbeats ago	=	2 weeks
$31 \cdot 10^{6}$	=	31 million	=	31 two-illion heartbeats ago	=	1 year
5ù10^{8}	=	500 million	=	500 two-illion heartbeats ago	=	16 years (college)
$1 \cdot 10^{9}$	=	1 billion	=	1 three-illion heartbeats ago	=	32 years (prime life)
$2 \cdot 10^{9}$	=	2 billion	=	2 three-illion heartbeats ago	=	Average lifetime
$42 \cdot 10^{9}$	=	42 billion	=	42 three-illion heartbeats ago	=	Mohammed
$60 \cdot 10^{9}$	=	60 billion	=	60 three-illion heartbeats ago	=	Christ
$78 \cdot 10^{9}$	=	78 billion	=	78 three-illion heartbeats ago	=	Buddha
$200 \cdot 10^{9}$	=	200 billion	=	200 three-illion heartbeats ago (8,000 years ago)	=	Earliest Egypt
$500 \cdot 10^{9}$	=	500 billion	=	500 three-illion heartbeats ago (15,000 years ago)	=	Earliest artistic culture (Thailand)
$1 \cdot 10^{12}$	=	1 trillion	=	1 four-illion heartbeats ago	=	30,000 years ago (Last Ice Age)

$75 \cdot 10^{12}$	= 75 trillion	= 75 four-illion heartbeats ago	= Leakey: Earliest human skull: 2 1/2 million years ago
$75 \cdot 10^{12}$	= 75 trillion	= Capital Wealth of World	
$1 \cdot 10^{17}$	= 100 quadrillion	= 100 five-illion heartbeats ago	= Age of our planet Earth
$3 \cdot 10^{17}$	= 300 quadrillion	= 300 five-illion heartbeats ago	= Known limit age of Universe (10 billion years ago)

1238.80 **Number Table: Significant Numbers** (see Table 1238.80)

1239.00 **Limit Number of Maximum Asymmetry**

1239.10 Powers of Primes as Limit Numbers: Every so often out of an apparently almost continuous absolute chaos of integer patterning in millions and billions and quadrillions of number places, there suddenly appears an SSRCD rememberable number in lucidly beautiful symmetry. The exponential powers of the primes reveal the beautiful balance at work in nature, which does not secrete these symmetrical numbers in irrelevant capriciousness. Nature endows them with functional significance in her symmetrically referenced, mildly asymmetrical, structural formulations. The SSRCD numbers suddenly appear as unmistakably as the full Moon in the sky.

1239.11 There is probably a number limit in nature that is adequate for the rational, whole-number accounting of all the possible general atomic systems' permutations. For instance, in the Periodic Table of the Elements, we find 2, 8, 8, 18. These number sets seem familiar: the 8 and the 18, which is twice 9, and the twoness is perfectly evident. The largest prime number in 18 is 17. It could be that if we used all the primes that occur between 1 and 17, multiplied by themselves five times, we might have all the possible number accommodations necessary for all the atomic permutations.

1239.20 **Pairing of Prime Numbers:** I am fascinated by the fundamental interbehavior of numbers, especially by the behavior of primes. A prime cannot be produced by the interaction of any other numbers. A prime, by definition, is only divisible by itself and by one. As the integers progress, the primes begin to occur again, and they occur in *pairs.* That is, when a prime number appears in a progression, another prime will appear again quite near to it. We can go for thousands and thousands of numbers and then find two primes appearing again fairly close together. There is apparently some kind of companionship among the primes. Euler, among others, has theories about the primes, but no one has satisfactorily accounted for their behavior.

1239.30 **Maximum Asymmetry:** In contrast to all the nonmeaning, the Scheherazade Numbers seem to emerge at remote positions in numerical progressions of the various orders. They emerge as meaning out of nonmeaning. They show that nature does not sustain disorder indefinitely.

1239.31 From time to time, nature pulses inside-outingly through an omnisymmetric zerophase, which is always our friend vector equilibrium, in which condition of sublime symmetrical exactitude nature refuses to be caught by temporal humans; she refuses to pause or be caught in structural stability. She goes into progressive asymmetries. All crystals are built in almost-but-not quite-symmetrical asymmetries, in positive or negative triangulation stabilities, which is the maximum asymmetry stage. Nature pulsates torquingly into maximum degree of asymmetry and then returns to and through symmetry to a balancing degree of opposite asymmetry and turns and repeats and repeats. The maximum asymmetry probably is our minus or plus four, and may be the fourth degree, the fourth power of asymmetry. The octave, again.

Afterpiece
