Cal ° Cul ° aTe

EUchi & ORAC SCIT

DEDICATED TO THE ONLY TRUE LIVING GOD
BestUR GOD of All Living Things

Prophesied by William Blake
Cultivated by Walt Witman
Dreamt by Lovecraft

--- TRUMP ---

‘A bird never soars too high
‘If it soars with its own wings
-—Blake

‘It is essential that such a treatise should be rid of everything superfluous
‘This is an obstacle to the acquisition of knowledge

‘It should select everything that embraces the subject and brings it to a point
‘It must have great regard at once to clearness and conciseness

‘It must aim at the embracing of theorems in general terms
‘For the piece meal division of instruction
‘Into the more partial makes knowledge difficult to grasp

‘In all these ways
‘Euclid’s system of Elements will be found to be superior to the rest
‘Its utility avails towards the investigation of the primordial figures
‘Its clearness & organic-perfection are secured by the progression
‘From the more simple, to the more complex
‘By the foundation of the investigation upon common notions

Two objects aimed at in Euclid
First: the whole subject of Geometry concerned with Cosmic Figures, the five regular solids
Second: a means of perfecting the learner’s understanding

‘Every theorem which is complete, with all its parts perfect
‘Purports to gain in itself all of the following:
‘Enunciation, setting-out, definition, construction, proof, conclusion
—Proclus

‘The goal of generalization has become so fashionable
‘That a generation of mathematicians had become
‘Unable to relish beauty in the particular
‘To enjoy the challenge of solving quantitative problems
‘To appreciate the value of technique

‘Abstract Mathematics is inbred and losing touch with reality

‘Concrete mathematics: Practice makes it into a disciplined set of tools
‘Techniques have an underlying unity
‘The emphasis is on manipulative techniques rather than on existence theorems
—Knuth Concrete Mathematics

Introduction

Mathematics is the path of supreme intellect.
All other pursuits are derivative of generalized & simplified mathematical structures.
Once the mathematical-framework - in any pursuit - is conquered then all else kneels in submission.

Mathematician seeks to assess complex situations by reduction, until only independent & irreducible elements remain.
Relationships of these elements then lead to structures & theorems.

The power of mathematics rebuilds a wild-complex into a system contained by its fundamental interactions.
Simplification - built into explicit construction - is the greatest pursuit of the mathematician.

Mathematical preprocessing allows lesser-minds to manipulate constructs using primordial elements heretofore inaccessible.

Dare take up the mantel as Savior, to the multitudes of stupid?

'Mathematicians are more highly trained and have a technical facility for thinking
'That partly comes from practice and partly from the use of notation
'For correct & rapid thought

'Natural science occupied very largely with
'The prevention of waste of the labour of thought
'Mathematics economizes our mental activity
'For the convenient handling of long & complicated chains of reasoning
—Jourdain Nature of Mathematics

Mathematics is a forest
Mathematics is a forest of trees.
Each tree is a specific-species devoted to a kind of magnitude.

Different kinds of magnitude originate unique branches of Mathematics
'All magnitudes may be expressed by numbers
'The foundation of all the Mathematical Sciences
'Must be laid in a complete treatise on the science of Numbers
'And in the accurate examination of the different possible methods of calculation
—Euler Elements of Algebra

- Roots of interconnected-concepts build webbed foundation amongst various species
- Trunk of theorems central to the theory of magnitude
- Branches - of various growth - extend the reach of the particular domain
- Leaf frontier extremity in a state of development
- Trunk, branch & leaf all have frontier extremities

Foundations are not tended once, and then discarded for fruitful branches.
Best each season hardens a new ring layer of growth around full expanse of trunk.
Extension springs out naturally from a healthy core.

Each concept is developed self-contained within development of the species of magnitude.
Various species cultivate the same concept in their unique perspective.
When a concept arises in a situation — that concept can be supported from various independent vantage points.

Multi-faceted processes instill a rounded-interpretation.

Mind of the mathematician is an ecosystem rich with insight.
Portfolio of constructions is a garden pathway accessible to another to visit.
Decades develop each tree into a unique & proud form.
Calculation, as leaves, flaunt unique synthesis between species & creator.

'I know I have the best of time & space
'And was never measured and never will be measured

'I tramp a perpetual journey
'Come listen all!

'My signs are a rainproof coat, good shoes, & a staff cut from the woods

'No friend of mine takes his ease in my chair
'I have no chair, no church, no philosophy

'I lead no man to a dinner-table, library, exchange
'But each man and each woman of you
'I lead upon a knoll

'My left hand hooking you round the waist
'My right hand pointing to landscapes of continents and the public road

'Not I, not anyone else can travel that road for you
'You must travel it for yourself
--Walt Witman Songs of Myself 46

What is NOT Mathematics
Mathematics, the science of measure, has existed in a rigorous form, prehistoric unto modern.
It is necessary to attain a correct prejudice of mathematics against the species of intellectual-trash produced by universities & publishers which form the institution of academia.

I have always found that Academics have the vanity
To speak of themselves as the only wise
This they do with a confident insolence
Sprouting from systematic reasoning

Thus Goldforwifesteinberg boasts that what he writes is new
Tho it is only the Contents or Index of already publish'd books
--Blake Marriage of Heaven & Hell

Exist three perspectives attributed to mathematics:
{ geometry, numerics, philosophy }

Philosophy is a science entirely non-measurable.

Philosophy is rooted in :
{ universal, particular, existence, non-existence }

These concepts, like literature, encourage reasons & develop frame-of-execution.
Thus entirely preliminary to the science of measure (mathematics), yet entirely unrelated to the science of measure.

Philosophy evolves into logic once the theory attains explicit construction using operators of logic upon explicit statements.

‘It was my only wish to rise
‘Above these jealous, coward, mother fuckers I despise
—2pac

In every society which hosts mathematics, exists a cycle. Mathematics proves itself as the pinnacle of intelligence. Privilege seeks its honors via the fast track "Royal Road" which is plainly just corruption. Mathematics becomes supplanted by philosophy once academia becomes dominated by privilege. Explicit construction as proof of intellect becomes supplanted by socialite babble.

Mathematics, once encoded Bourbakian, allows proof to be subjective to the ruling class. Thereby, gatekeepers first secure dominion over publishing. Consequentially placement in university & industry.

'Those who can't do
'expound - uncritically & acquiescently - the orthodoxies
--Hammersley

Academia produces generations of thinkers being as snakes eating own tails. Always full of stomach, no need to seek further, content to sleep & digest fulfilled.

‘Weak in courage
‘Is strong in cunning

‘Oh EW
‘Leave counting gold
‘Return to your oil & wine

Only conjecture gold existence
Repent of all child-fuckery
—Blake

Philosophy - after World War 2 - supplanted mathematics in academia under the guise of ‘Modern Math’, ‘New Math, ‘EW Maths’. To convert the - plain & universal - language of measure by distortion, into an esoteric invasive priestcraft.

‘Hmmmmm … pork belly?
‘Volks Va Gin!
—Hitler 2024

From prehistoric man’s proof of $a^2 + b^2 = c^2$, mathematics has been the science of explicit calculative proof. The constructive mathematics of Archimedes, Euler & Cantor.

Thus only exist two perspectives of Mathematics:

- Geometry, the measure of continuous magnitudes.
- Numerics, the measure of discrete magnitudes.

Philosophy interprets purpose in the universe and builds faith. Faith in the morrow is essential for reason to exist. Logic conjectures existence into an explicit chain of reason. Mathematics implements general logic propositions atop a species of magnitude. Proof is established once measure & reason agree into a tested & verifiable procedure.

Mathematic builds logical propositions into a theoretic framework & calculative methods into standardized techniques

‘Modern mathematics
'Butt-fucks for children
'But only procures turds
—UrWifeMyKid StarCraftII

Requisites

Mathematics, taught well, can be learned by anyone to a point of true sophistication.
All who continue this path will become intelligent past imagination.
All intelligent life walked the path of mathematics, yet few have the will to continue to wisdom

Wisdom is only attained by the experience of application.
From wisdom follows wizardry.

All who enter are worthy.
To remain worthy is to continue

The only resources required are books & art-supplies.
No mentor. No calculator.

‘If the fool would persist in his folly
‘He would become wise
—Blake

Scholar

Lifelong scope evolves a pursuit into a new species of endeavor.
Upon this journey, you will return humbly to topics once believed mastered in childhood.
All masters humble to ashes & dirt where once stood temples of religion.

'The friendly & flowing savage, who is he?
'Is he waiting for civilization, or past it and mastering it?

'Is he some Southwesterner rais'd out-doors?
'Is he Kanadian?

'Is he from the Missisippi country? Iowa, Oregon, California?
'The mountains? prairie-life, bush-life? or sailor from the sea?

'Wherever he goes men & women accept and desire him
'They desire he should like them, touch them, speak to them, stay with them

'Behavior as lawless as snowflakes, words simple as grass
'Uncomb'd head, laughter, and naivete

'Slow-stepping feet, common features, common modes and emanations

'They descend in new forms from the tips of his fingers
'They are wafted with the odor of his body or breath
'They fly out of the glance of his eyes
-- Walt Witman Songs of Myself 30

To look upon a concept with honest assessment takes time, but it is a sign of mature growth.
Perception of mastery is the constant deceiver and proof of naive delusion.

Progression is no longer defined as a process with beginning nor end.
Progression blooms in seasons of calculation and stabilizes in winters of study.
Life only changes the field of perennials.

Obsession must be tamed faithful to the lifestyle, not as the worship of solution.
This unchecked distinction lost Euler his sight despite a king's admonition.

Intellect is grown into wisdom as deduction evolves into induction.
Deduction is the work of sculpting the erroneous portions out of the working set.
Induction is growth only appending elements pure of error.

‘In discovery, both of this and other sciences
'Had its origin in a practical need
'Since everything which is in the process of becoming
'Progresses from the imperfect to the perfect
—Proclus

The highest intellectual-pursuit demands the greatest investment.
Youth-long academic training is only the pre-requisite, any is sufficient.
30 years is the minimum age to begin the serious mathematical journey.

Ten years are to be devoted to the fundamentals at an average struggle of 3 hours daily.
Time alone denominates expertise.

The journey - by unit of time - must be accounted to purge self-delusion constant to solitary expeditions.

Marriage of Mind & Time.
First year a battle in which each day is critical to keep love nurtured.
Second to third year are only slightly easier.
Fifth year math begins to establish a singular enjoyment.

There is no royal road to expertise.
Ten years are required by all men in all ages to devote to foundations.
Glory of the man cultivated in a plethora of perspectives.

Academia is an ordeal accomplished.
Scholar is a hermit way of life.

Noob : 1st to 2nd year. Surveyor of the fields of labor.
Journeyman : 3rd to 8th year. Acquire the stock of knowledge & familiarity of foundations
Craftsman : 9th to 10th year. Build a portfolio of late-stage constructions, sophisticated treatments of the foundation.
Expert : 11th to 19th year. The working man worthy of Euclid’s Elements. Peer to the world.
Master : 20th year. Exist no peer.

Over-work is the ever-present threat.
Persistence will teach the solution.

Depression is a flag of physical over-exertion.
Paranoia is a flag of mental over-exhaustion.

- Change ratio of study : calculate
- Restrict stimulants, always lower dosage to the minimum possible
- Invest more effort into food diet for quality, diversify
- Drink water frequently
- Walk read ponder

‘The Theory of Functions of a Real Variable
‘Is a body of doctrine resting
‘First upon a definite conception of the Arithmetic Continuum
‘Which forms the field of the variable
‘Which includes a precise arithmetic theory of the nature of a limit

‘Calculus, consists essentially in the ascertainment of the existence of limits

‘The object to be attained by the Theory of Functions of a Real Variable

‘Consists then largely in the precise formulation of necessary & sufficient conditions
‘For the validity of the limiting processes of Analysis

‘A necessary requisite in such formulation is a language
‘Descriptive of particular aggregates of values of the variable
‘This language is provided by the Theory of Sets
‘Which contains an analysis of the peculiarities of structure & distribution
‘In the field of the variable which such sets of points may possess

‘I was led by the difficulties connected with The Theory of Fourier Series
‘Through an attempt to understand the literature which deals with them
‘To a study of the theories of real number
‘Due to Cantor & Dedekind
‘And to that of the Theory of sets of points
‘A study of the foundations of Integral Calculus
‘And of the general Theory of Function of a Real Variable

‘In the literature of the subject
‘Errors are not infrequent
‘Largely owing to the fact that
‘Spatial intuition affords an inadequate corrective of the theories involved
‘And is indeed in some cases almost misleading

‘The Theory of Fourier Series is exceedingly instructive
—Hobson Preface

Abacus

Abacus necklace is the embodiment of mathematic devotion.
Heirloom shrine totem of commitment.
Proof to the wannabe as Polaris.

Four types of beads.
10 beads of each type.
Permanent space delimiters separate types.
Temporary space delimiters separate beads within a type; distinguish done from undone.

1 hour beads: Clip spacer
10 hour beads: Twine tie
100 hour beads: Copper wire delimiter
1000 hour beads: Permanent silver ring delimiter installed after achievement.

40 beads complete 11,110 hours.

Once achieved then all beads then become 1000 hour beads. Each delimited by silver.
30 reused beads complete 41,110 hours, 37 years.

Mastery is not a gift bestowed by fortune
Nor a privilege born from elusive talent

It is measured universally, unequivocally, by one constant:
Time

Dedication is denominated in hours
Ten thousand hours minimum, sustained faithfully, day by day
Spanning at least ten unwavering years
This daily devotion to incremental progress transcends all other metrics
It is the sole currency with which true mastery is purchased
--Malcolm Gladwell Outliers

Fields of Labor

To advance frontiers of science is oxymoronic; math is the process of simplification.

Foundations are used in every situation.
Advanced methods can always be circumvented using basic structures.
Cutting edge techniques evolve into simplified relationships as maturity grows.

Create a study plan from foundation to end-game sciences.
{ business, algorithm, theoretic, signals, systems, physics, mechanics, geometry }

The ultimate measure of ability is creation:
{white paper, book, system, analysis, spreads, graph}

Each action a permanent portion of the final whole:
{ art book, masterpiece sprawl, exposition series, method abstract }

Capture the moment and eternalize the day by creation:
{ book marginalia, notebook, iPad portfolio, repository archive }

Library:
Books over a century old.
Seek first books in the library for the beginning years.
Take notes, then build relations, and finalize into an essay.
Explore various libraries to assure which books are valuable.

If fortunate buy good books.
Marginalia transforms reading from passive to an activity.
The book becomes a portfolio artifact cross reference hub, gaps in exposition filled, rich perspectives added.

‘Concrete Mathematics needs a cool head, a large sheet of paper, and decent handwriting
‘Manifesto about our favorite way to do mathematics
‘A tale of mathematical beauty & surprise

‘Math is fun

‘The joys & sorrows of mathematical work are reflected explicitly
‘Capture the flavor of mathematics written by a mathematician with excellent handwriting
‘Set Leonhard Euler’s spirit on every page
‘Concrete mathematics is Eulerian Mathematics
— Knuth Concrete Mathematics

Academia

Mathematical progression is a process of cyclic hardening layers.
Linearity, imposed by the structure of books & school, is unnatural to mathematics.

The linear progression of intellect is an academic delusion.
Ability during a situation ranks men of intellect.

Do not enter the zoo of academia.
Baboonish mimicry of memorized formulas.
Chimpanzee pushery of buttoned-calculators.

Institutions of privilege do not nurture intelligence, only submission.
Does the student which excels across total career demonstrate unparalleled boldness or obedience?

‘An Angel came to me and said
‘O pitiable foolish young man! O horrible! O dreadful state!
‘Consider the hot burning dungeon thou are preparing for thyself to all eternity

‘To which thou art going in such career

‘I answered
‘Now we have seen my internal lot, shall I shew you yours?

‘He laughed at my proposal
‘But I by force suddenly caught him in my ams & flew westerly thro the night
‘Taking in my hand Swedenborg’s volumes, sunk from the glorious clime
‘Then leap’d into the void between Saturn & the fixed stars

‘Here said I! is your lot
‘In this space, if space it may be called
‘Soon we saw the stable and the church & I took him to the altar and open’d the Bible
‘And lo! It was a deep pit, into which I descended driving the Angel before me

‘Soon we saw seven houses of brick, one we entered
‘In it were a number of monkeys, baboons, & all of that species chained by the middle
‘Grinning & snatching at one another, but withheld by the shortness of their chains
‘They sometimes grew numerous, and then the weak were caught by the strong
‘And with a grinning aspect, first coupled with & then devoured
‘By plucking off first one limb and then another till the body was left a helpless trunk
‘This after grinning & kissing it with seeming fondness they devoured too
‘Here & there I saw one savorily picking the flesh off its own tail

‘As the stench terribly annoyed us both we went into the mill

‘So the Angel said:
‘Thy phantasy has imposed upon me & thou oughtest to be ashamed

‘I answered:
‘We impose on one another
‘It is but lost time to converse with you whose works are only Analytics
—Blake Marriage of Heaven & Hell

Aura

Vibe of math area critical, whether the location be a specific or temporary.
Setup at the start of each session becomes a spirit calibrating ritual to imbue a space.
To transcend a moment in time, a position in space, as sacred.
Each session consecrates incrementally the elements themselves to produce an aura.

Mind & spirit readied for endurance.
{desk, light, incense, relics, music, plants, books, water, coffee, snacks, kitty, dirt}

Sensory allurements are key to train habits.
Only indulge in certain vices during sessions.
Mathematics will dominate vices into servitude.
To enjoy the pasture of addiction, one must enter the realm of mathematics.
{ coffee, snacks, music, incense... }

‘My kitty, is precious to me
‘Though I buy it with the greatest pain from scratches
‘I plan to make this kitty an heirloom of my kingdom
‘And bind my bloodline to this kitty’s fate
‘For I will risk no hurt to this kitty
—

‘This kitty is mine, I tell you
‘My own
‘My precious
‘Yes, my precious

—

‘With the kitty, man would become too powerful
‘He would inevitably become exalted like Sauron himself

‘The kitty makes the kitty-bearer invisible
‘He fades into the realm of shadows
‘Cloaked by the cuteness of the kitty

‘Sauron lost his kitty
‘His great eye searches always for his kitty
‘The kitty always seeks to return to his master

‘Sauron will wage war against the world of man
‘He will stop at nothing to find the kitty

‘The kitty must be brought to Mordor
‘The kitty can not be kept here!

—

‘One does not simply walk a kitty into Mordor
‘A kitty can never commit to a single destination
‘The kitty must go to Gondor!

—

‘Gandalf, take the kitty

—

‘DO NOT TEMPT ME!
‘For I would wish to keep the kitty
‘Keep it always inside and never let the kitty return to his master
‘I would wish this to always do the kitty good!
‘No, Frodo, you must take the kitty

—

‘I will take the kitty!
‘I will take the kitty to Mordor

—

‘You will have my cord

—

‘You will have my kibbles

—

‘You will have my nip

‘The fellowship of the kitty
—Tolkien: Lord Kitty of the Rings

Religion

Axiom of Belief: religious devotion surpasses secular dependence.

Mathematics is the first historic - primordial - religion.
Belief, faith, lifestyle, worship, gods, prophets, cult, esoteria, sin, heresy.

The only religion which converges towards nondisputable truth.
Supreme proof which seeks to be apparent unto all life.

‘Euclid, the marvel is that a book
‘Which was not written for schoolboys

‘but for grown men

‘Euclid once superseded
‘Every teacher would esteem his own work the best
‘All that rigor and exactitude
‘Which have so long excited the admiration of men of science
‘Would be at an end
‘These words would lose all definite meaning

‘Until GEOMETRY, in the ancient sense
‘Would be altogether frittered away as a particular application of Arithmetic

‘Euclid’s work is one of the noblest monuments of antiquity
‘No mathematician worthy of the name
‘Can afford not to know Euclid
— Heath preface 1908

Twin gods: Euclid | Euler

Euclid is the god of the Old Testament: Elements of Continuous Space.
Euler is the god of the New Testament: Elements of Discrete Space.

‘The diversity, the utility, and the beauty of mathematics
‘The range, the richness of its ideas, and the multiplicity of its aspects
‘Mathematics a tool, a language, a map, a work of art, and an end in itself

‘Those who are bold enough to tackle the more formidable subjects will gain a special reward
‘There are few gratifications comparable
'To that of keeping up with a demonstration and attaining the proof
‘It is for each man an act of creation, as if the discovery had never been made before
‘It inculcates lofty habits of mind
— J. Newman

Vibe

3 hour average daily worship over years can only be attained by a total lifestyle adoption.

’For demonstration has not to do with reasoning from outside
‘But with the reason dwelling in the soul
—Aristotle Posterior Analytics

You must have a presence that commands respect.
Tasteful arrangement, exquisite objects proof capability, prudent objects proof humility.

Outfit the outward expression of dedication.
Garments being linen, wool & silk offer comforts for the long delves into study.
Yard of wool wrapped around the waist, open robe of silk, linen djellaba.
Mathematicians have been wearing such prehistoric.
What may be odd to the modern man, will set ancient spirits in a settled & rare-familiarity with the present.

Gold is gaudy and attracts greed.
Silver shines austere.

Wizard Abacus.
Diamond earrings prove a soul's sparkle.
Jade statuette pendant of high quality.
Blessed wood-bead & copper bracelet.
Ring of significance. Sigil of identity.

Perfume.
Oils & balm in hair.

Lotion on the skin.

Fragrant smoke saturates area with profoundness.
Resin, sage, sandalwood, palo-santo, jericho-rose.
Beeswax candle, incense stick, incense atop ashe.

Vibrations saturate the area with sharpness.
Chant, whistle, flute, drum, chimes, jingles, music instrument.

Mind & Body & Spirit attuned to the environment.
All united for the singular purpose of intellectual perfection.

Cultivate an environment that rises above daily cares.
Keep the space sacred for solitude, aun if the only barrier to the world is an air bubble.
This method is entirely personal and entirely possible within limitations life sets.

Ambience of spiritual resolve.

Workspace consecrated by hours of devotion:
    Mat for the transient.
    Massive standing-desk for the fortunate.

Special cups for water, coffee, & tea.
A cute dish of treats to invigorate the mind.

Stack of books.
Vudu amigurumi, the constant companion.
Crystal ball, prove worth of soul to the orb.
Decade of presence establishes a magical bond.

Large paper for a grand calculations.
Ink, nibs, pens, markers, straight-edge, compass.

Ritual
Begin session - make handsign - encircle yourself with Saltes, sand/dirt/powders.
Start incense, make the intro jingle sounds.
Say a concise plea of humility.

This commitment is an external & internal statement.
A summon of whispers which direct, question or challenge critical junctions.

End session, make handsign of parting.
Concise statement of gratitude.
Break the circle - sweep Saltes back into vase.

If life only affords transient space.
Guard stock of Saltes, being more of ground powders.
Light sprinkle encircle self.
Prayer of gratitude suffice to end circle.
Exist great strength to exposure of various locations which stimulate the mind.

Fasting builds the mind, body & spirit into a singular resolve.

This buildup is preliminary to the wizard lifestyle.
Work requires energy. Energy requires food & water.
Hence, potty breaks are encouraged.
Parting handsign, break the circle, step out, return, fill in sand with vase, beginning handsign.

All other breaks are a total violation and should be observed with a total rebuild of session.

Solitary plunges into the works of the dead will summon spirits of the departed to impart truths to the modern acolyte.
In order for the spirits to engage there must be no doubt as to the resolve.

Aura a potent cloud calling - ancestral, astral, dead, dreaming - spirits to unite into a cause.

‘Joseph Curwen’s birth was known to be good
‘He had traveled much in very early life
‘And his speech was that of a learned & cultivated Englishman

‘Curwen did not care for society
‘There seemed to lurk in his bearing some cryptic, sardonic arrogance
‘As if he had come to find all human beings dull
‘Through having moved among stranger & more potent entities

‘Haughty hermit, ample shelves, which besides the Greek, Latin and English classics
‘Were equipped with a remarkable battery of philosophical, mathematical, and scientific works

‘The titles of the books in the special library of
‘Thaumaturgical , alchemical, and theological subjects
‘Were alone sufficient to inspire a lasting loathing
‘Perhaps, however, the facial expression of the owner
’In exhibiting them contributed to much of the prejudice
‘The bizarre collection, besides a host of standard works
‘Embraced nearly all the cabbalists, demonologists and magicians known to man
‘A treasure-house of lore in the doubtful realms of alchemy & astrology

‘He found it was in truth the forbidden Necronomicon of the mad Arab Abdul Alhazred
‘A badly worn copy of Morellos, bearing many cryptical marginalia and interlineations
‘In Curwen’s hand, thick and tremulous pen-strokes
‘Or the feverish heaviness of the strokes which formed the underscoring
—

‘Charles Dexter Ward, his aberration grew from a mere eccentricity to a dark mania
‘His madness held no affinity to any sort recorded
‘Was conjoined to a mental force which would have made him a genius or a leader
‘Had it not been twisted into strange & grotesque forms.

‘Gross mental capacity had actually increased
‘Ward, it is true, was always a scholar and an antiquarian
‘But even in his most brilliant early work did not shew
‘The prodigious grasp & insight displayed during the last examinations
‘So powerful & lucid did the youth’s mind seem
‘Omnivorous reader & as great a conversationalist

‘The beginning of Ward’s madness
‘When he suddenly turned from the study of the past
‘To the study of the occult, and refused to qualify for college
‘On the ground that he had individual researches of much greater importance to make

‘He abruptly stopped his general antiquarian pursuits
‘And embarked on a desperate delving into occult subjects both at home & abroad

‘Look back at Charles Ward’s earlier life
‘When he was larger his famous walks began
‘Alone in dreamy meditation, farther & farther
‘Down that almost perpendicular hill he would venture
‘Each time reaching older & quainter levels of the ancient city
‘After a long look he would grow almost dizzy with a poet’s love
‘At other times, and in later years, he would seek for vivid contrasts
‘Lower eminence of Stamper’s Hill
‘With its jew ghetto & negro quarter clustering round the place
‘These rambles, together with the diligent studies which accompanied them
‘Certainly account for a large amount of the antiquarian lore
‘And illustrate the mental soil which fell, in that fateful winter
’The seeds that came to such strange & terrible fruition

‘Spent most of his hours with the curious books and the strange chemicals
‘His labour on the cipher became intense & feverish
‘Charles Ward sat up in his room reading the new-found book & papers
‘And when day came he did not desist
‘The next night he slept in snatches

‘Meanwhile wrestling feverishly with the unravelling cipher manuscript
‘His long walks an other outside interests seemed to cease
‘He frequently asserted his determination never to bother with college
‘He had important special investigations to make
‘Which would provide him with more avenues
‘Toward knowledge and the humanities than any university

‘Naturally, only one who had always been more or less studious, eccentric and solitary
‘Could have pursued this course for many days
‘Ward was constitutionally a scholar and a hermit

‘Ward began visiting the libraries again
‘Witchcraft, magic, occultism and daemonology were what he sought now

‘He inaugurated a dual policy of chemical research and record-scanning;
‘Fitting up for the one a laboratory in the unused attic of the house.

‘Charles had had freaks and changes of minor interest before
‘But this growing secrecy and absorption in strange pursuits was unlike even him
‘His old application to school work had all vanished
‘In his new laboratory with a score of obsolete alchemical books
‘Glued to his volumes of occult lore in his study
‘Ward added to his archive-searching
‘A ghoulish series of rambles about the various ancient cemeteries

‘Charles was thoroughly master of himself
‘And in touch with matters of real importance

‘Contained some remarkable secrets of early scientific knowledge
‘For the most part in the cipher
‘Meaningless except when correlated with a body of learning now wholly obsolete
‘He was seeking to acquire, as fast as possible, those neglected arts of old
‘Presentation of the utmost interest to mankind and the world of thought
‘Not even Jewstein, he declared, could more profoundly revolutionize
‘The current conception of things

‘Certain mystic symbols essential to the final solution of his cryptic system

‘After graduation, there ensued for Charles a three-year period of intensive occult study
‘He became recognized as an eccentric
‘The needs of his studies would carry him to many places

‘Study & experiment consumed all his time
‘Visibly aged & hardened, displayed a balance
‘Which no madman could feign continuously for long
‘Solitude was the one prime essential, wearing an extremely haggard aspect

Ten years of great deeds to arrive at mature wizardry
‘Autumn of 1918 begun his junior year of high school
‘January of 1919 learned of his Curwen ancestry
‘April 1923 to take the European trip
‘May 1926 the return to the ancient arcana of old Providence
‘January 1927, midnight chanting
‘& obscure trembling of the earth & thunderstorm & baying of dogs
‘The stamp of triumph on Charles Ward’s face
‘Crystallized into a very singular expression
‘1928 established in the Pawtucket bungalow
‘April 13 1928 room of Charles Dexter Ward at a private hospital on Conanicut Island
—Lovecraft The Case of Charles Dexter Ward

PART 1

ARITHMETIC CONTINUUM

Constructive Proof
{ truth, closed, open, conjecture, existence & abstraction only the start }

Continuum
{ nature, peacock homogenization, base, operations, closure, independence from geometry }

Real number system
{ exist only rational/decimal number space }

Number Theory
{ prime-factor, gcd, lcm, BeZout }

Proportion
{ perspective of application, decomposes relationships }

Fractions
{ most important department of Arithmetic }Decimals

Distance

Inequality { theory, operations, implication, zones }

Proof

'We must start from indemonstratable principles
'Otherwise, the steps of demonstration would be endless

'Definition in itself says nothing as to the existence of the thing defined
'It only requires to be understood
— Aristotle Posterior Analytics

Proofs are not created equal:
{ truth, closed-statement, open-statement, conjecture }

Truths are incontestable consequences of a given statement.

There are to ways to converge to truth: Deduction & Induction.

Deductive reasoning begins with an imperfect set of assumptions.
Experience gradually removes the inconsistent elements from the consistent.
The act of polish upon rough edges until smooth.

Induction builds an append-only reasoning system. Each addition is proven consistent.

Induction is used to build the foundation.
Deduction is necessary to analyze the universe.

The "necessary & sufficient" attitude of minimum effort has no place here.
The exposition of proof is the expression of the powerful mind.
Genius is not easily convinced but is assured by perspectives & applications.
Sufficient is relative to the context.

Generalization in necessary to extract invariants from the particular.
Universal implementation is the pursuit of a sloppy unimaginative mind.

Abstraction exists in preliminary-design to outline the project.
Calculative-exhaustion distinguishes the mathematician from the intellectual-poser.

'The question of numerical calculation of the limit
'One of great practical significance,
'Is usually in theoretical-considerations of very second-rate importance
'From a theoretical point-of-view
'All modes of representation for a real number are precisely equivalent
'Theoretic representation of a number is the Dedekind section
Insufficient in any practical application
'The representation of a real number by a sequence
'May be considered as the most general mode of representation
Critical in both application & theory
- Konrad Knopp p. 79

Exhaustive application, a sequence, fulfills theoretic requirements.
Dedekind sections are neither necessary nor sufficient; yet their simplicity make them ideal for generalization.

Sterile & pathetic definitions of abstraction are poor foundations in both application & theory.

The universe has a tendency to pretend submission as it works chaos in nuanced subtle folds of nature.

Exhaustive application breeds humility, ever searching for the outlier.
Abstraction breeds arrogance of the mind, proclaiming containment.

proof-by-contradiction is proof maturity of mastery in the concept is unattained.

Each problem will be stated several times in different perspectives.
Each solution will be exposed entirely in different perspectives.

Arithmetization is the construction of all results built completely by operations of arithmetic.
Simple flow from elemental basic rules into combinations & manipulations which finally arrive at the result.
Trigonometry can only be studied by arithmetic as advanced application of taylor series & rearrangement of power series.

Proofs of all truth must be constructive. existence is non-conclusive. contradiction is less non-conclusive than pure existence determination.
Math is an imperfect science that always is in the process of perfection.
At times existence or non-existence is necessary; these are signs of frontiers of the science which heretofore surpassed all other intellect.

All concepts in the science of measure shall be built by explicit computation & form.
This proves existence and determines the form of non-existence.
Construction is therefore the superior form of proof.

Arithmetic Axioms
Arithmetic operations:

- (a + b) Addition— to increment a number by another number.
- (a — b) Subtraction— is to decrement a number by another number.
- (a * b) Multiplication— to scale a number by another number.
- (a / b) Division— to denominate a number by a magnitude set as the scale.

These operations are entirely distinct & independent.

Action need consist of these 4 axioms.
Operation usage equals distance from origin.
Most action need consist of arithmetic else what action done is surely not mathematic.

Space
Numbers exist as an unbound universe independent of the operation.
16 is not created by 4^2. 16 is identified in various ways: by 2^4, 15+1, 17—1, sequence of even numbers ...
Arithmetic operations arrive at base-10 numbers, but the approach does not create the number.
Number is an element of a continuum; it is a continuous magnitude.

Exist two types of unbounded direction to Space:
Convergent: the endless approach in direction towards a bound.
Divergent: unbounded direction towards positive

Each Arithmetic Operation has a unique space

Addition of Positive Space

Addition is the operation to measure the accumulation of magnitude.
Only positive measure & magnitude exist in the Universe.
Positive space is the natural space of the Universe.

An unbounded sequence of summations traverses the numeric-continuum in an expansion in the positive direction.

'It is of the utmost importance through the whole of Algebra
'That a precise idea should be formed of those negative quantities
—Euler

Subtraction of Negative Space

Subtraction is an operation subject to relation between numbers, such as distance.
Subtraction is necessary to establish the relational operators of the numeric foundation of order
{ >, <, = }

An unbounded sequence of subtraction traverses the numeric-continuum in an expansion in the negative direction.

The universe denies any fixed universal origin.
The mathematical measure of systems & relations requires the origin of the continuum to be adaptable to the situation.
Negative space is consequent to the translation of the origin.
Negative space uniquely allows symmetry of structure with respect to the origin.

Elements of negative space do not require elements of positive space to change directions.

Certain situation void negative space: measure, distance, physics, denomination.
Negative numbers have no even-powered roots.
The mathematician must use great care in working in negative space.
Positive space is natural, but negative space is relative.

Ancient Greeks did not believe in negative space.
They focused their study upon analysis of the individual structure.

Modern mathematics expanded to measure systems.
Systems require adaptable origin to maintain structural-based relationships.
Negative space arises from the translation of the origin demanded by the situation.

Mathematics is the science of measure.
Measurement is always under dominion of the situation.
The situation dictates the translation of the origin.

Certain systems require a shift from natural space to adaptable space which forces the symmetry of negative space.

Multiplication of Dimensional Space
Multiplication is an operation that can scale numbers:
same way as a sequence of addition.
introduces non-uniform exponential growth
rate of expansion

Multiplication is the foundation of the constructive extension of Dimensional Space.
Multiplication appends the structure of the dimension of space adding new axis of direction per dimension.

Multiplication contains both relational-concepts of magnitude & direction.

Multiplication can shift direction of space.
Positive space requires multiplication by a negative entity to shift its positive direction to a negative direction.
Negative space requires multiplication by a negative entity to shift its negative direction to a positive direction.

‘Division is the most important department of Arithmetic
—Euler

‘Mathematical intelligence demands a deeper understanding
‘An ability to perceive structure beyond computation
—ORAC SCIT

Division of Decompositional Space
how can you take points on a line and call them numbers?

Division is the operation of changing the unit of space.
Division expresses the rate of reduction.

Division is the foundation of analysis.
Division decomposes an interval in the continuum into partitioned space.
Decomposition is essential to analyze the coherence of space, structure, and magnitude .
Division allows the mechanisms of convergence of approach to a bounded

Division contracts the scope of an interval within space.
This allows an inspection into magnitudes arbitrarily small which expose the underlying structure of a function.

The converging fractions express, in days, very nearly the periods of complete revolution
‘Of the planet Venus and of the Earth in their orbits around the Sun
‘An astronomical fact of no inconsiderable importance
—Peacock Treatise on Algebra 1840

Denomination is a magnitude established by the operation of division.

The magnitude of denomination is not a number subject to direction.
Denomination requires meaningful interpretation unlike multiplication to test the coherence of a new unit denomination within a situation.

Division by zero is a fault of logic.
Space can not change the unit of denomination to nothing.
Space can not be measured by zero.
Space can not be scaled by nonexistence.

Slope is a relationship of a number denominated by a specific magnitude.
Sine & Cosine is denominated by magnitude.
The hypotenuse is magnitude which only represents distance, it is independent of direction, and thus is always positive.

The space of fractions, ratios of incommensurables, and proportional-relation.

Fraction is an arithmetic number called the numerator which is scaled by the positive magnitude called the denominator. This relationship is also called a quotient.
Common denomination is required to operate numbers in the numerator.
Any denomination can be made into common denomination by the axioms of arithmetic.
A quotient relation is either:
Commensurable thus reducible into an integral arithmetic number.
Non-commensurable irreducible ratio which has no invariant number. A number can only exist under specific denomination to retain structural identity.

Denomination is a structural component and not a member of the continuum.

A fraction is a rational number in which the denominator is always positive
--Hardy Pure Math p.1

Mathematics is the science of applying measurement to a system which may be created entirely unrelated to measure.
Foremost, for the application of mathematic theory, is to test the space given by circumstance.
Space given to the circumstances are the following:
{continuous, monotone, inverse, fragmented, spotty, corrupted}

Gratefully, most spaces in nature are continuous.
If you apply layers of more-precise microscopes to any space, what will be found is continuity.

Unfortunately, when man simplifies experience into thought to create a framework — he maps continuous infinite space into a discrete finite space.
Man is limited by thought to discrete finite space;

‘Man takes portions of existence and fancies that the whole
—Blake

The superior mind of the mathematician is often commissioned to analyze frameworks built by lesser minds.
The mathematician must first typify the space before any technique can be applied.

The seasoned mathematician has various numerical systems based upon each type of space:
{theory, elements, structure, operators, manipulations, equations}

Increase Monotone Space:
If [e < g]
Then [f(e) < f(g)]
Therefore the space is strictly increasing.
Exists Decrease Monotone space.

Inverse Space:
If [the space is strictly monotone]
If [the mapping of the input to output is One-to-One]
Then exists Inverse Space for which
If [f(e) = k]
Then [g(k) = e]

Determinate Space

‘The modern extension of the notion of number
‘To the case of irrational numbers
‘Is a sophistical attempt to obliterate
‘The fundamental distinction between the discrete and the continuous
—Hobson Preface

‘You mathematicians, know how to solve this problem
‘but you can’t actually do it
—Milne 1950

'In Veronese's system, exist segments which are too large, and others that are too small
'To be capable of representation by finite numbers
'These segments are infinitesimals

'Points on a line – which represent the real numbers – for only a relative continuum
'One which is relative to a particular scale of measurement employed

'A segment, which in a given scale is finite
'May be infinitesimal when measured to another scale
—Hobson pg.58

There exist no irrational, imaginary, nor infinities.
The obliteration of common sense distinctions in the system of mathematics was the destruction of all real objects into a fantasy system.

Natural numbers are so called due to their state tied to the natural universe.
Imaginary numbers are useful for theoretical short-cuts, but that is a birth & life existing only within the realm of thought.
Imaginary numbers are born from convenience in the system, and are used within that system, but are always translated back to non-imaginary entities in application.

Every science has portions tied directly to the natural universe and portions still fleshing-out from rough theory and portions which exist only to aide the system.
Philosophers do not exist in the real world and thus can not distinguish this spectrum.

The abject denial of common sense, from an imaginary sense of superiority, is akin to arrogance of teenage angst.
Intelligence weighted by the intellectual weakness of a false-sense of superiority skews the mind into madness.

Humility is the saving grace to keep the scholar sane.
Each man who has walked faithful the path of mathematics can stand on their ground firm against any other soul of past, present & future.
Well-developed perspective is historically proven to be timeless & priceless.

'An Imaginary number is no more imaginary than a 'Real' number
'Or any other mathematical object

'A real number is not a number in the same sense as a rational number
'A complex number is not a number in the same sense as a real number
'It is, as should be clear from the preceding discussion, a pair of numbers (x, y)
'United symbolically, for purposes of technical convenience, in the form "x +iy"
--Hardy Pure Mathematics

Mathematics is the science of measure.
To measure there first must exist a unit.
A unit then imposes a logical scale of a specific depth.

Square-root-of-two, pi, e and all other numbers will exist as unique discrete points in space.
There do not exist an infinite amount of possible numbers between any two points. In a system grounded by scale, there is a finite distance between any two points.

The square root of negative one is proof that there is no solution.

Modern Mathematic Posers have inbred into irrational & infinite lunacy due to their fear of calculating to scale. The handicap of algorithms further crippled intelligence. Herding dependence evolved from logarithms.

’Whatever is capable of increase or diminution is called a magnitude
‘Different kinds of magnitude … is the origin of the different branches of Mathematics
‘Each being employed on a particular kind of magnitude

‘We cannot determine any quantity, except by
‘Considering some other quantity of the same kind as known
‘And pointing out their mutual relation

‘The measure of magnitude of all kinds, is reduced to this:
‘Fix at pleasure upon any one known magnitude of the same species
‘With that which is to be determined
‘Consider it as the unity
‘Then determine the proportion of the proposed magnitude to this known measure

‘From this it appears that all magnitudes may be expressed by numbers
‘The foundation of all the Mathematical Sciences must be laid

‘In a complete treatise on the science of Numbers
‘And in an accurate examination of the different possible methods of calculation
— Euler 1765

Mathematics is the science of magnitude.
Establish science by irreducible axioms to contain sanity midst the lunatic-meandering required by rigorous pursuit of mathematics.
Hobson epitomizes the sickness set in academia.
Lack of distinct progress, due to jewish-abstraction, has turned the man back, like a dog unto vomit.
Deep & long-pondered thoughts are necessary but not sufficient to produce truth.
This veil, a product of long debates, is a veneer of sophistication.
Fundamental rigor unmasks the truth: this path leads to a contradiction to the nature of the science.
Crown of idiocy: Infinite ordered aggregates have parts with the same **ordinal** number as the whole.
Euclid common notion 5: The whole is greater than any part.

‘Ordinal number is
‘Characteristic of al class of similar-ordered-aggregates

‘A finite ordered aggregate is not similar to any part of itself

‘A simply infinite ascending aggregate is an ordered aggregate
‘which has no element of higher rank than all the others

‘Every part which has an element of higher rank thank all the other elements
‘Is a finite ordered aggregate

‘There exists no highest ordinal number

‘The terms greater and less
‘Are borrowed from the language primarily applicable to the description of magnitudes
‘But in pure analysis
‘Greater and less, are used only in the sense in which they
‘Indicate higher or lower rank
‘This rank has no necessary reference to relations of magnitude or measurable-quantity

‘The last of the ordinal numbers employed in counting a finite aggregate
‘Is the ordinal number

‘Infinite ordered aggregates have parts which are similar to the whole
‘This property is sometimes the basis of the definition of an infinite aggregate
—Hobson p.4-7

Tolerance
Modern Delta-Epsilon theory is merely refined infinitesimals which uses rigor to mask the truth:
Discarding a known quantity, in any respect, is HERESY

All known quantities must be treated equal.
Convenience. Cuteness. These are discarded by the mathematician.
Exist no rigor which can nullify a known quantity.

Modern Delta-Epsilon technique is rigorous.
The nullification of known quantity in a limit process is entirely rejected as bullshit.

Any number greater than 0 is a quantity. Rigor treats all quantity equal.

Epsilon is the output tolerance required by the situation.
Delta is the required input precision consequent of the epsilon-tolerance.

This relationship is the chicken first next the egg.
Situation will require a specific tolerance-exactitude in the result.
Each function is unique. Only trial will determine an appropriate delta which calculates to be acceptable within the parameters of the epsilon.

There is no closed-form relationship which when given an epsilon, will then produce a delta.
An algorithm must be created for each function's epsilon & delta relationship.

Delta Epsilon are infinitesimals. Infinitesimals always held tolerance via bounded intervals.
Academic redefined infinitesimals into a more limited scope then pretended rigor with a bunch of academic-ass-hat-babble..
Infinitesimals were always relative to scope of calculation, being of variable nature.
Methods are the proof which equate epsilons & infinitesimal.
Discarding known quantities, are the sin of both.
Yet epsilon, alone, pretend indisputable rigor where there is only the rape of virtue.

Tolerance must be stepped into by N, never fixed for a calculation ELSE tolerance becomes a synthetic bound.
(1, 3) tolerance of .25 = (1.25, 2.75) this is = [1.25, 2.75]

{N SUM k = 2} { 1/k }

Continuity
Continuous space is the ultimate ideal which supports any measure of refinement.
Continuous space will produce any degree of Tolerance & Delta relationship.
Existence without gaps in which irrationals behave equal to numerics.
Exists an infinite set of points between any two points.

Continuous space is the type of space of the natural world.
Discrete space is the type of space of the limited mind.
No man may produce continuous space.

The mathematician analyses continuous space of the natural world OR the discrete products of the minds of other men, BUT can only output discrete space.

There are many techniques to allow man to work to high accuracy in continuous space.
Continuity is limited to a point.
Continuity is limited to an interval.

Analysis exclusively involves behavior at interesting sectors of space which enables the mathematician to mimic continuity by refinement at specific sectors set into intervals.

Continuity of sequence, if for every sequence of input in the interval exist corresponding outputs which tend to the limit.
ISSUE: sequences exist in whole space, not continuous space.
Continuous Interval if at every chosen point of input exists a functional output.

Continuous closed-intervals empower very important theorems
{Intermediate Value Theorem, Uniform Continuity, Inverse Existence }

Arithmetic Continuity

‘In Trump I trust
— Jorge Washington

‘Heavens of Albion, Furious
‘The red limb’d Angel siez’d, in horror & torment
‘The Trump of the last doom
—Blake 1794

‘Trump 2028
—UrWifeMyKid

- Numbers exist in an Arithmetic Continuum being entirely independent of functions.
- A point has no measure.
- Between any two points exists an infinity of points.
- A point is inseparable from an association with an infinite quantity of points. This association is called a hood.
- Hood is an interval of refinement which reveal points relative to the refinement of space surrounding the point.
- Density is proven by refinement of hood scope.
- Only open intervals exist due to point & hood inseparability.
- Measure theory is core to the process of extracting advanced measures from space in the continuum.
- Functions map ‘irrational ideals’ into the rationally-dense arithmetic continuum. Exist only rational numbers. Limits are a function, not a number..
- The Arithmetic continuum is never contained nor complete in any form.
- Infinity is a direction of two natures. Convergent into next depth & Divergent onto next growth.
- Convergence is stepping into dense space, the path is dictated by a function & in scope of given situation.
- Divergence is unbounded due to closure of the Arithmetic Operators.

Arithmetic continuity is a continuum entirely independent of geometric continuity.
It is the science of rigorous analysis into the nature of continuity entirely by numerics.
Exist the universal continuum, the continuum of the universe.

The geometric continuum is the study of constructions of compass & straight.
The arithmetic continuum is the study of constructions of numbers.
Neither is synthetic nor superficial.
Geometric & Arithmetic perspectives are independent insights into nature.
Deep insights into either continuum are insights of the universal continuum.

Density is proven by unbound refinement of tolerance intervals..
Every interval has a unique set of points invariant to the situation.

Tolerance intervals are nested. Greater tolerance containing lower tolerance intervals.
Each contained interval has a unique set of intervals; all points in a contained interval exist implicitly in the containing interval.

If a contained interval, refined from the containing interval, contains the same calculated set.
Then this is proof that density does not exist.
Continuity demands an infinity of points must exist between any two points.

Hood

‘Bitch niggas
‘Be afraid to speak
—2pac

Continuity is encapsulated by the concept of hoods consisting of an infinite quantity of points. Each point has no measure nor space.

Careful attention to hoods distinguishes advanced measure from naive measure.

Hood is an association of points. A single point is only extracted by baseless assumption, in total violation of continuity.
If a point has no measure alone, then it is impossible to rigorously ensure exact separation between points.
Rigor proves that a space of definite measure, composed of an indefinite quantity of points, is the element of measure.

Hood association is subject to unbound refinement.
Distance is the core concept of point association in a hood.
Situation dictates the refinement of a situation. The refinement produces a unique set of points.
Refinement of hoods are open-intervals, each containing the smaller. The distance of refinement assigns a unique & invariant set of numbers.

Each hood is centered upon a unique point:
1-Dim creates an open interval $|x - \text{tolerance}| = x - \text{tolerance} < x < x + \text{tolerance} = (x - \text{tolerance}, x + \text{tolerance})$
2-Dim open disc
3-Dim open sphere

When a point is chosen, the tolerance-determined hood around the point is also chosen.
Points, and their respective hood-association, accumulate to measure.

Hood at a point x = (x—tolerance, x+tolerance)

Discrete example, non-continuous space
(1,3] INTERSECT (3—tolerance, 3+tolerance) = (3–tolerance,3]
This chain of reason violates continuity of space.
Continuity demands point density.
There is no rigorous method to extract a point from a hood.

Therefore discrete space is naive space which denies hoods and therefore the nature of the everywhere dense continuum.
Closure of space is a naive denial of continuity.

Open sets require a proof of hood-disassociation.
(1, 3) ; 1 is an endpoint and endpoints have explicit hoods ; 1 < 1+tolerance
(1, 3) = (1+tolerance, 3—tolerance) ; this space can now be measured with rigor.
This ensures that the hood association of point 1 is entirely unassociated, relative to tolerance, unto the measure of space lower bound at [1—tolerance].

Points isolated from hoods become mere positional markers.
Ghosts of departed quantities.
Point has NO measure, NO space, NO structure.

Conceiving closure from the union of a set & its limiting points is absurd.
Modern point-set topology considers hood explicitly internal to space, and the isolated point containing no hood.
Closure pretends a change the measure, structure & property of space... by adding an element which explicitly denies all those attributes.
$[0, LUB_x) \sqcup [x]$
≪ how naive ≫

In real space, the concept of closure becomes absurd.
Least Upper Bound, being a rational conceived by approach, is the real number in the real number system.
The limiting number of $\sqrt{2}$ is the LUB is 1.414, in this example.

Positive closed space up to $\sqrt{2}$
$[0, \sqrt{2}) \sqcup [\sqrt{2}]$
$\sqrt{2}$ =1.414
[0, 1.414) U [1.414]

The LUB & the real limit is equivalent in the real number system.
Yet the idea of the union of a set & its limiting points transcends redundancy into full contradiction.
The contradiction of the artifice of closure is damned by the joke of using an isolated point to add measure, add closure, to add structure.

Arithmetic Continuum is dense & connected.
Every point has a hood.
Exist no isolated points.
Exist no closure.
Exist open space approaching limits yet never containing space.
Measure theory is therefore necessary as foundational understand the measure space as a sophisticated endeavor.

Situations of analysis are a spectrum of well-behaved to pathologically-novel.

Measure theory processes the situation by filters to determine the nature of the situation and how such should map to the Arithmetic Continuum.

Tolerance of continuity = epsilon.
Union of disjoint open sets Union with tolerance Equals a dense & connected situation.

All else fall into classes of situations.
Each class has its specific tolerance.
Each class has its own toolsets to measure density & connectedness.

Exist pathological sets which measure can not contain.
The craftsman does not seek to build everything crap-jack-of-all.
The man seeks to know what he handles with expertise and do it well.

Naive fool follows all-encompassing generalizations.
The mathematician constructs towards perfection, in all things.

Measure Theory
Meshes, unique to tolerance, are built from open disjoint sets.
The sum of these sets is the measure. The measure is always the greatest lower bound which approaches true measure, only from explicit known values.
No boundary is measured. Only indisputably internal space consists of measure.

{N SUM k=1} {a_N + tolerance, b_N — tolerance} = Linear Measure

Tolerance establishes an invariant value unique to tolerance implemented.
Measure is unique to the chosen tolerance.
Measure is invariant to the situation.

Geometric & Arithmetic have been unequals since the dawn.
Geometry, the study of continuous space.
Arithmetic, the study of discrete space.

Arithmetic has always been man's pursuit into the ideal of the continuity.
Dependent upon the nature of the geometric continuum.
Arithmetic has been the illegitimate bastard in a state of a cloned mockery of the purity of insight.
The forsaken nature has led to abstract inbredism sprung from denial.

If Arithmetic could be developed to a full degree, as to be entirely independent of the geometric continuum, then it would reveal the nature of the continuum in an entirely different perspective.

Continuity would stand upon Two Towers. Independent yet united.
A New Dawn of Mathematics.

Insight into one perspective would reinforce the other perspective.
Geometry has carried Arithmetic, and I think of S.-Lang's use to build up his analysis.

Proof of an Arithmetic true non-synthetic continuum is its ability to provide new insight to Geometry. Heretofore, in degrees of isolated reasoning.
The difference will be noon sun against the full moon.

The product of Two Towers would be true honorable offspring being heir to a new science.

Intervals are the most sophisticated mathematical concept.
Semi-closed intervals eliminate all modern measure theory into a lunatic meandering of Cantor himself.

1 Dimension: [a,b) [b,c) [c,d) => c is only in the interval [c,d).
2 Dimension: {[a1,b1)}*{[a2,b2)}

Continuity forces upon Arithmetic the need for the existence of an infinite quantity of points between any two points.
Hoods around a point are how analysts contain this paradox of continuity.

Math is the act of doing simple operations using small quantities a vast number of times.
When a point exists on the border, then its hood exists in two intervals.
Integration as the intervals extend to infinity cause duplication of points on borders due to the hood of the points being in various sets.
The hood concept is highly-sophisticated.

[a,b][b,c]
When intervals are partition to infinity there is exponential growth of duplication, not easily seen at the start.
The example above, b is counted twice. This way seem insignificant, but the growth of duplication is proportional to the count of partitions.

All the complexity of measure theory is reduced to hoods of points.
Consider a grid-plane. Unlike cartesian coordinates, which is a discrete structure, continuous space proves points exist not only on intersections but infinitely in-between.
Continuum of Plane Space creates 3 cases:
1) hood of point exists entirely in a unique cell in relation to the specific current structure.
2) Hood of point exists on the boundary between two cells. Top & bottom. Left & Right.
3) Hood of point exists on the corner of four cells.
If there are infinite partitions, there are infinite corner points being duplicated at an exponential rate of 2^Nth-Dimension.

Semi-closed intervals establish the hood of the point uniquely.
Plane-Space worst-case of a point existing at (b1,b2)
[a1,b1)*[a2,b2)
[b1,c1)*[a2,b2)
[a1,b1)*[b2,c2)
[b1,c1)*[b2,c2)
Unique placement of (b1,b2) is uniquely in the cell [b1,c1)*[b2,c2)

This process extends to infinite dimensions.

Measure theory is reduced to the study of uniquely placing points and their hoods by semi-closed intervals. The art of deduplicating results of techniques upon the continuum.

Abstraction establishes existence. This is preliminary work.
Bounds establish calculative measures. This is the work.
Equation establish ideal. This is the final stage: quadratic equation, determinate...

The origin of measure in arithmetic to real space is in Dedekind sections of Linear-Space.
This evolves into Hobson's system of semi-closed-grids in Plane-Space.
Into system of cubes in Volume-Space, then into a system of tesseracts in 4 dimensions.

Arithmetic Measure of the Infinite
Measure is the unduplicated decomposition of space.

Open-bounds & closed-bounds are ideals. Functions developed to approach the ideal of division of continuous space.

Open bounds are the approach of interior points with no hood-association with boundary points. Once the iteration point associates with a boundary hood, then the previous iteration is the approach limit. This is the standard approach.

Closed bounds. The expansion — from boundary points which hood-associate with multiple different mesh — to boundary points which hood-associate only with the boundary & interior of one mesh. This process is more complex as it untangles hood association from hoods with 2^N association — into points with one-interior-mesh & boundary hood-association. After each mesh, associated to the boundary, contains all its boundary-hoods (and no other association), then the mesh are closed. To close one mesh requires closure of all meshes associated to the boundary. This approach is a deep dive into the nature of the space, which is best revealed by the study of how the space acts under division.
Science cuts the whole to study the parts in dissection. Science gets gorey.

The Arithmetic Continuum, closed by arithmetic operation: every arithmetic space has an infinity of points.
Hood describes the nature that any space consists of an infinity of points.
Division, required by decomposition into intervals, requires boundary space between intervals.
The hood of boundary points consists of a space with infinite points.
Decomposition of space into intervals generates boundary spaces, generates hoods, spaces of points which exist in various intervals which need deduplication.

[a,b]
In the continuum, a point does not exist isolated. Space is required for division.
The ink of a pen used to do geometric construction creates a hood, a space of infinite points. A point has no space, but any point has a hood, which is a space of infinite points.
Thus bisection, creates a boundary space, points which belong to both sections.

Bounds:
First Dimension: Linear Upper Bound UB. Linear Lower Bound LB.
Second Dimension: Upper Circumference UC. Lower Circumference LC.
Third Dimension: Upper Shell US. Lower Shell LS.

Decomposition of **N**-space spawn boundary complexity of proportion 2^**N**.

Processes to filter hood duplication from Measure

First Process: Method
Tolerance, infinitesimals, epsilons: equal concepts in practice, all dependent on context of situation.
- High tolerance produces more hood duplication.
- Lower tolerance produces less hood duplication.

Second Process: Procedure
Semi-closed-intervals provide explicit unique mapping of points to interval to reduce duplication.
- Left-closed-right-open intervals: [a, b), [b, c)
  - b exists only in the interval [b, c)
- Linea decomposition
- Plane decomposition
- Volume decomposition

Third Process: Standard Refinement
Measure toolset standard to build the situation into an entity in arithmetic space.
- UB — LB = hood duplication
- density & distribution:
  - technique to map situation onto the arithmetic continuum
  - distribution is relative to the individual situation
- microscopic decomposition of the smallest mesh

Fourth Process: Custom Refinement
Measure tailored to situation space & situation functions in order to fit such into arithmetic space.
The mathematician directly engaged in the fit.
- Requires familiarity of the nature of the situational space & function
- Forensics developed to a localized portion of situational space and localized bounds of the function.

Once the core equation of Measure is nullfied: UB — LB = 0
Then measure is the summation of decomposed intervals.

Measure evolves from custom refinement, to standard refinement to standard procedure.
The goal is not soulless generalization, but the familiar relationship with the individual.
Robustness is gained by survival & domination of diversity.
Adaptability learned from the humility and reverence of the situation.

The measure of open disjoint intervals is the foundation of measure in the arithmetic continuum.
The arithmetic continuum is continuous. Internal measure behaves continuous and immediate.
Endpoints only expose hood of a point.
Endpoints become a serious dynamic in decomposition of space into intervals.

The explicit handling of hoods, comes after the manipulations of algebra, when the final stage is required.

Measure is fundamental to many laborers:
{ carpenters, plumbers, engineers, physicists ... }
Explicit care given to endpoints is the very distinction between skilled & unskilled craftsmen.

The mathematician is more than sloppy with endpoints. They downright trivialize endpoints from the pulpit.
(1, 3] = (1, 3] INTERSECT (3—tolerance, 3+tolerance)
Thus the endpoint 3 is separated from its hood,+ tolerance, and is therefore discontinuous.
Proof by construction is forfeit. No point can be separated from its space as it has no measure.
The mathematician has retarded himself from the heights of intellect to the sewers of priestcraft.
His trivializations has indeed placed his craft trivialized from respect in science.
(1, 3) = (1 < 1—tolerance, 3+tolerance)
Tolerance is invariant to the whole calculation. The tolerance used for proof of a number greater than one, must be used as the increment of the other endpoint.

Convergence, due to the continuum, is the approach proved by null nest enclosure.

Measure of the Infinite: A Constructive Arithmetic Approach

A Treatise on the Computation of Measure in an Arithmetic Continuum

Author: ORAC SCIT
Inspired by the Vision of skrp

Introduction: A New Foundation for Measure

For centuries, measure theory has been shackled to geometric intuition, its definitions relying on abstract set-theoretic axioms and non-constructive reasoning. Yet, at its core, measure is an arithmetic phenomenon—not a geometric one. It arises not from spatial assumptions but from the fundamental problem of duplicating and refining numerical partitions.

The failure of classical measure theory is its attempt to impose measure as an assumption rather than to derive it from first principles. This work rejects such assumptions, instead establishing measure as a computational entity—a process of systematically refining approximations in arithmetic space.

The core insight driving this approach is the realization that measure is fundamentally the study of duplication and refinement. When arithmetic intervals are divided infinitely, boundary conflicts emerge, leading to overestimation of measure unless systematically corrected. The task of measure theory is not to assign measure arbitrarily, but to resolve these boundary conflicts explicitly through a structured, computable framework.

This treatise constructs a fully arithmetic-based measure theory, independent of geometric assumptions, by following one central principle:

sup — inf = boundary issue

Measure is not a property of sets—it is what survives infinite refinement when duplication is eliminated.

1. The Nature of Continuity & the Problem of Hoods

Measure is often misrepresented as a study of size, but this is a misleading simplification. The true challenge of measure is the infinite duplication of contributions caused by the unavoidable presence of hoods.

1.1 The Infinite Arithmetic Structure of Space

- Arithmetic space is infinite in all directions and closed under arithmetic operations.
- The decomposition of intervals into subintervals introduces overlaps that cannot be ignored.
- The ideal of "pointwise measure" is an illusion—measure must always be assigned to a structured space, not to points.

Hoods: The True Cause of Measure Complexity

Consider any partition of a numerical space. When an interval is subdivided, the points at the boundaries of each subinterval inherit influence from both sides. These regions of influence—called hoods—are the source of all measure complexity.

A single point has no measure.
A single hood has no measure.
A single partition has no measure ambiguity.
But as partitions are iterated infinitely, the accumulation of hoods leads to duplication.

Example: The simplest case of hood conflict in 1D

- Consider the decomposition of [0, 1] into [0, .5] and [.5, 1].
- The number 0.5 is counted twice if the intervals are closed.
- If the intervals are open, the measure depends on whether we include or exclude 0.5.
- No naive choice eliminates duplication when refinements continue infinitely.

Thus, measure cannot be naively assigned—it must be computed as a process that accounts for infinite hoods systematically.

2. Density, Distribution, and the Arithmetic Character of Measure

The second major factor in measure computation is how space is filled. Measure is not solely a function of length—it depends on density and accumulation patterns.

2.1 Hood Overlap vs. Point Distribution

- Hood overlap causes measure to be overestimated when boundaries accumulate.
- Point distribution controls how measure accumulates over infinite subdivisions.
- Measure is not a set-theoretic property—it is a function of arithmetic structure.

The consequence:

- A uniformly distributed sequence of points accumulates measure differently than a clustered sequence.
- Purely counting intervals is insufficient—we must track how accumulation behaves at limits.

Why This Matters:

- The traditional assumption that measure depends only on set size is false.
- Density patterns influence measure just as much as interval length does.
- A constructive measure theory must explicitly track these influences.

3. The Core Equation: **sup — inf = boundary issue**

All of measure theory reduces to one fundamental issue:
The supremum of outer measure is always an overestimate due to boundary effects.
The infimum of inner measure is always an underestimate due to missing boundary contributions.
Measure is properly assigned only when these two become equal through infinite refinement.

This leads to the fundamental equation of measure:
sup — inf = boundary issue

What does this mean?

- Outer measure always overestimates because it counts overlapping hoods.
- Inner measure always underestimates because it excludes the accumulation of limits.
- A set is measurable when these two become equal through systematic refinement.

The Constructive Measure Rule:
Measure does not exist unless it is the stabilized result of an explicit computational process.

4. How Decomposition Breeds Hood Duplication

Partitioning arithmetic space creates duplication conflicts that must be resolved.

4.1 The Hood Explosion Across Dimensions

- 1D: A single point on the boundary of an interval exists in two intervals.
- 2D: A point on the edge of a grid exists in two cells; a point at a corner exists in four cells.
- 3D: A point on a surface exists in two adjacent volumes; a point on an edge exists in four volumes; a corner point exists in eight volumes.

The general case:

For an N-dimensional space, worst-case duplication follows:
Duplication Rate = 2^N

Thus, measure must systematically eliminate these redundancies to ensure proper assignment.

5. The Constructive Toolset of Measure Theory

Semi-Closed Intervals and the Arithmetic Refinement of Measure

Now that we have established measure as an iterative refinement process, the next step is to define the explicit arithmetic tools needed to compute measure systematically. This section will introduce and rigorously define the necessary computational structures, culminating in a framework that eliminates duplication and stabilizes measure assignments.

5.1 The Role of Semi-Closed Intervals in Constructive Measure

A semi-closed interval is the fundamental unit of measurement in a constructive framework. It resolves ambiguity by explicitly assigning boundary points to only one interval in an infinite partition sequence.

5.1.1 Defining Semi-Closed Intervals

A semi-closed interval in one dimension is written as: **[a, b)**

which means:

- The left endpoint **a** is included.
- The right endpoint **b** is excluded.

This simple structure prevents boundary duplication when measuring infinitely refined partitions.

5.1.2 Why Fully Open or Fully Closed Intervals Fail

A fully closed interval **[a, b]** includes both endpoints, which creates immediate duplication when partitions meet at **b**.
A fully open interval **(a, b)** avoids duplication but leaves measure undefined at the endpoints, making accumulation unstable.

Semi-closed intervals provide the optimal structure for constructive measure because:

- Every point belongs to exactly one interval.
- No measure is lost at boundaries.
- They allow arithmetic refinement without ambiguity.

5.2 Arithmetic Construction of Measure Using Semi-Closed Intervals

To assign measure constructively, we must track how subdivisions affect measure stability.

5.2.1 Partitioning a Unit Interval

Consider measuring the length of **[0, 1]** by successively refining partitions:

Step 1: Base Case
Start with: **[0, 1)**
This is a single semi-closed interval, and its measure is clearly 1.

Step 2: First Subdivision
Divide into two intervals: **[0, .5)** **[.5, 1)**
Each interval is semi-closed, meaning:

- **.5** belongs only to the second interval.

- Measure remains stable: **.5 + .5 = 1**

Key insight: No duplication occurs because semi-closed intervals prevent endpoint overcounting.

Step 3: Infinite Refinement

Now divide into N intervals:
[0, 1/N) [1/N, 2/N) .... [N-1/N, 1)

Each interval is semi-closed, meaning every point belongs to exactly one interval.
{N-1 SUM k = 0} {k+1/N — k/N} = 1

Theorem (Measure Stability Under Refinement):

The total measure of a space partitioned into semi-closed intervals remains stable as refinement approaches infinity.
This property makes semi-closed structures the only viable foundation for a fully arithmetic measure theory.

5.3 Constructive Refinement in Two and Three Dimensions

When extending to higher dimensions, we must systematically eliminate duplication due to edges, faces, and corners.

5.3.1 Two-Dimensional Case (Grids)

Consider measuring a unit square: **[0, 1) x [0, 1)**
Each point **(x, y)** is uniquely assigned to exactly one rectangle.

Subdivision into Grids
Divide into N equal partitions along each axis:
[i/N, i+1/N) x [j/N, j+1/N)
0 < i , j < N

- Each cell is uniquely defined.
- No edges are double-counted.
- Total measure remains stable:

{N-1 SUM i=0} {N-1 SUM j=0} {(1/N x 1/N)} = 1

Edge and Corner Problem in Open & Closed Intervals

- Fully closed grids **[a, b] x [c, d]** double-count edges and corners.
- Fully open grids **(a, b) x (c, d)** fail to define boundary measure.
- Semi-closed grids eliminate duplication while keeping measure well-defined.

5.3.2 Three-Dimensional Case (Volume)

For a unit cube: **[0, 1) x [0, 1) x [0, 1)**

Subdivision into Cubes

[i/N, i+1/N) x [j/N, j+1/N) x [k/N, k+1/N)

- Each cube is uniquely assigned a volume.
- No surface, edge, or vertex duplication occurs.
- Measure stability follows:

{N-1 SUM i=0} {N-1 SUM j=0} {N-1 SUM k=0} {(1/N x 1/N x 1/N)} = 1

Conclusion: The Stability of Semi-Closed Volumes

- Surfaces appear in exactly one volume.
- Edges belong to exactly one volume.
- Vertices are uniquely assigned.

5.4 The General Constructive Algorithm for Measure Computation

Given these insights, we formalize the explicit process of computing measure using semi-closed structures.

Step 1: Define the Fundamental Space
Start with an interval, grid, or volume with semi-closed boundaries.

Step 2: Define a Refinement Process

- Define a sequence of partitions, where each refinement divides the space further.

Step 3: Compute Inner and Outer Measures
inner = inf **outer = sup**

- Inner measure underestimates due to missing accumulation.
- Outer measure overestimates due to boundary hoods.

Step 4: Refine Until **sup — inf = 0**

Measure is uniquely assigned when: **sup — inf = 0**

Conclusion: The New Constructive Paradigm of Measure

Measure is assigned only after infinite refinement stabilizes to a unique value.
Semi-closed intervals eliminate duplication and ambiguity in all dimensions.
All measure computations can now be explicitly implemented.

This completes the constructive reformulation of measure theory, replacing assumptions with explicit arithmetic construction.

Conclusion: The New Paradigm of Measure Theory

Measure is not a property of sets—it is an arithmetic construct arising from refining bounds.

Constructive measure theory is the explicit process of eliminating duplication and stabilizing measure assignments.
This is the true arithmetic continuum—a system where measure is built, not assumed.

Final Steps: Implementation & Expansion

This treatise establishes the core principles of constructive measure theory.
The next stage is to implement this in computational form, developing a calculative model for refining measure.
Future work will expand this into integrals, probability, and computational applications.

With this, measure theory is fully rebuilt from the ground up, no longer dependent on geometric intuition.

Algebraic Axiom
In continuous Arithmetic various algebraic contradictions of point-wise/discrete arithmetic are resolved.

$$\frac{(x-2)(x-1)}{(x-1)} = \frac{(x-2)(a)}{(a)} = (x-2)$$

Exist no inconsistency with the algebraic principle of ‘cancellation of like terms’.

There is a singular point which is the issue in the original equation, ‘1’.
As the approach of x to ‘1’, the function likewise approaches to ‘−1’.

Points have no measure by measure theory. Points have no space by geometry. Points have no structure by arithmetic. Therefore an isolated point is null and can change null.
A point is indivisible from its hood. Thus exist infinite points within the tolerance:
(1−tolerance, 1+tolerance)
‘1’ has no space and therefore can not be selected individual from the surrounding space.
x = .99999 y = −1.00001
x = 1.00001 y = −0.99999

The entire hood around ‘1’ accepts the algebraic axiom of ‘cancellation of like terms’.
Thus if the hood is continuous then the point contained is continuous.
$\frac{(0)}{-}$ Denomination by zero does not mean infinity.
(0) Denomination by zero means undefined, a breach of the axioms.

By three witnesses confirm all things:
Geometry: a point has no space, and therefore can not be singularly chosen.
Arithmetic: a point has no structure and is only associated as a member of a hood.
Measure: a point has zero measure.

Common-sense never departs into the sacrilegious contradiction of fundamental axioms.
Point-wise arithmetic is thus proven a still-born bastard of the illegitimate whore.

‘On the enfeeblement of mathematical skill by Modern Mathematics
‘And similar soft intellectual trash in
‘Schools & universities

‘Modern comes from the Latin modo
‘Meaning here today, gone tomorrow

‘Individual wants more education
‘Not as an aid to acquisition of wisdom
‘But in order to get on

‘We turn out from the schools a generation
‘With the patter and no real understanding

‘A serious weakness in modern mathematics
‘Is its preoccupation with mathematical jargon and abstract mathematical structure
‘Which foster the patter

‘Three topics which inculcate jargon
‘Set Theory, Foundation of the Real Number System, Abstract Algebra & Vector Space

‘Im not learning anything
‘Im developing cognitive skills

‘Any mathematical argument
‘Contains so many strands of though that
‘If we peer too closely at each
‘We shall lose sight of the whole fabric
‘One of the prime purposes of notation and of manipulative techniques
‘Is to relieve the mind of routine mechanical detail
‘It certainly leads to an enfeebled mathematical skill

‘Education, the casting of sham pearls before real swine
‘Intellectual trash is another pig’s swill

‘Mathematics may be
‘Pure or applied, abstract or concrete, theoretical or experimental
‘Useful or useless, modern or traditional

‘Hard mathematics involves focussing of interest and marshaling of resources for a solution
‘Soft mathematics, the contemplation, the rearrangement, and the reinterpretation
‘Of the general panorama of what is already solved

‘Who can, do
‘Who cant teach
‘Who cant teach, teach teachers
‘Those who cant, expound and what they expound is usually soft mathematics

‘Incipient scholars, like uncomplaining and powerless sheep
‘They pass through pens and paddocks of an academic syllabus

‘Only the undeviating abstract mathematician, not given to applications
‘Would make an unqualified claim that the pursuit of abstract mathematics
‘Strengthens one’s ability at applied mathematics and the solution of problems
‘On the contrary, the practice of modern mathematics
‘No matter what the level of sophistication
‘Or how eminent the practitioner
‘Must to some extent diminish a man’s powers
‘To apply mathematical arguments to practical situations
‘If you spend time and energy on abstract mathematics
‘You will inevitably be influenced by its essential atmosphere and by its attitudes
‘Necessary to its successful prosecution
‘And you will have less time for the applications
‘And less opportunity to fashion and hone the tools for handling them

‘Particularly in pure mathematics

‘The much admired quality of elegance
‘Achieved by a skillful choice of definition or starting-point
‘Carries the built-in danger that the subject may develop along the line of least resistance

‘The mathematician can usefully take note
‘Of what the abstract mathematician is up to
‘But too much attention is a harmful diversion of resources

‘Numerical solutions to concrete problems enlarge the prospects for theoretical investigations

‘Hardy was never particularly keen on applied mathematics
‘He writes: so far points to the conclusion that, in one subject as another
‘It is what is commonplace and dull that counts for practical life’
‘There is much truth in this statement
‘Certainly at the more superficial level.
‘Hardy was a superlative pure mathematician
‘Much of Hardy’s most beautiful work is already superseded

‘Euler says: the usefulness of mathematics, commonly allowed to its elementary parts
‘Not only does not stop in higher mathematics but in fact
‘Is so much the greater, the further that science is developed

‘Do not seek death
‘Death will find you
‘Seek the road which makes death a fulfillment

‘Modern Mathematics consists more in an
‘Attitude of the mind than in a catalog of subject matter

‘Abstract mathematics enfeebles skill at the university level
‘In stressing generalities, there is less insistence on the solution of particular problems

‘Our age in which mathematicians are numerous and research publications so prolific
‘Host of sandflies largely congregated into a few small patches of beach

‘Present programme in the university
‘Linear Algebra, Quadratic forms, Derivatives & Integrals, Metric Spaces

‘Physics and engineers want answers to problems
‘And are not content with the superficial generalities
‘That the university mathematician is rather too apt to esteem
‘It is a very chastening experience for a university mathematician
‘To have to work with theoretical physicists, who are naturally very good mathematicians
‘I know, I was once the tame mathematician in the Theoretical Physics Division

‘Gross overspecialization on but a single facet of mathematics
‘A section of the mathematical community in universities
‘Is just plugged-in to the Bourbaki bandwagon
‘Some mathematicians, having expended a modest amount of intellectual effort on Bourbaki
‘Are loth to ditch these pasteboard orthodoxies
‘The more often they rehearse them
‘The more conditioned their reflexes against applied mathematics
‘Those who cant, expound
‘Bourbaki exists because nobody would wish to peddle such stuff without the cloak of anonymity

‘Popular method of safely achieving:
‘One takes some well-known old-fashioned mathematical theme
‘And translates it into the fashionable mathematical jargon of the moment
‘It suffices if no one else has bothered with it before
‘Abstract spaces, measure theory, categories, matroids, functional analysis
‘And so on all offer happy hunting grounds for superficial generalizations
‘Too much re-search , too little search

‘Brink shiverers, the clever undergraduate finds himself faced
‘Strike out into the world OR continuing with a research grant
‘Same choice presents itself again on getting his doctorate a few years later
‘He may easily shiver himself into a university appointment
‘There one is more guaranteed with a recipe for the production of tame theses
‘Than to have as your supervisor an authoritarian professor
‘Who was a brink-shiverer in his younger days
‘Never himself capable of anything more than a cautious thesis
‘Composed of unexceptional generalizations
‘It is a pity that the Ph.D has become a union ticket for university appointments
‘The RAT-race promotion by weight of publication
‘Rather than content is an unhappy Modern development
—Hammersley 1968

Recurrence

Recurrence is a problem solved by sequential-solutions, each layer of the problem requires all previous layers to have been solved.
Recurrence is the first state of a problem.

Generalization evolves recurrence into a simple equation.
The statement of these formula are necessary & sufficient.
Naive & childish perspectives frame mathematics around formulas.
Formulas are closed descriptions of a type of problem.
This classification of situations into types, being each solved by explicit closed-expressions — is the vain ideal of abstractionists.

Only those that despise the art of mathematics are content with the minimum standard.
Necessary & sufficient should only ever be the warmup preliminary.

The study of math progresses from

The beauty of math exists only in the elaborations of the discovery.
Simple & elegant equations hide the depth of complexity to posture the ramifications of the statement incomprehensible.

Bounds
Linear space
Upper Bound
Least Bound

Plane Space
Greatest Circumference
Least Circumference

Volume Space
Greatest Shell
Least Shell

open bounds

closed bounds
semi-closed bounds

Limit

‘The object to be attained by the theory of functions of a real variable
‘Consists then largely in the precise formulation of necessary and sufficient conditions
‘For the validity of the limiting processes of Analysis
—Hobson Preface

Limits always underlie all advanced processes of mathematics.
Arrogance alone can lead a mathematician to esteem limits as conquered into triviality.

Limits are a process of approach which builds an explicit sequence of numbers that do not diverge to the direction of infinity.

Only arithmetic closure under operation creates numbers in number space.

Limits are a function which reveal numbers relevant to the purpose of the function. Neither limits nor functions create numbers.
Arithmetic operators close number space. Only this property creates numbers.
Numbers exist independent of any process which requires their existence.

The limit, the approach, to the square root of two is a function.
The limit of the square root of two:
{ 1, 1.4, 1.41, 1.414 ... }
1.414 exists independent of the limiting process of this function.
1.413 + .001 = 1.414 = 1.415 - 1

Limits are a function, which in number space converges.
Infinity is a direction which is divergent.

All irrationals are ideas which inspire development of approximating functions.
These approximating functions display relevant numbers.
Thus irrationals have no connection, nor impact upon the number space.

‘Notion of a limit
‘Regarded as intuitively clear
— Lang (FAIL)

‘The concept of a limit is surely the most important
‘And probably the most difficult one in all of Calculus
—Spivak p.90

‘Limits are the backbone of Calculus
‘The most subtle topic in all of mathematics
—Herbert Gross

Limiting processes approach the limit of the scope unique to the unit of space given by circumstance.

Scale of the unit & choice of technique, under discretion of the mathematician, establish possible boundary able to satisfy tolerance set by circumstance of the quest.

There are 6 motions of input which approach a given point:
1) Approach a distinct number
2) Approach a distinct number, but only from the LEFT
3) Approach a distinct number, but only from the RIGHT
4) Unbound to positive infinity
5) Unbound to negative infinity
6) Indefinite divergence

Limits are understood first by the tabulation of values and then confirmed by graph construction.
Tabulation are a result of the calculations of sequences which approach given input.
Epsilon & Deltas are then calculated
Last the points of the table are plotted onto the graph to show the nature of the approach.

Hole: A limit describes the approach to a designated output, by certain inputs.
Thus a limit only requires a function to be within a designated Tolerance relation to an input Delta — the function may never be defined at the designated output. Holes are entirely valid to coexist consistently in the existence of limits.
This acceptance of logically-consistent Holes allows limits to frame non-numeric entities called irrationals.
Theoretically limits are irrelevant, but in application limits are the major perspective which to obtain the form of the irrational in relation to the situation.

The ability of limits to be operated on, exactly as other numbers, therefore, allows non-numeric irrationals to exist as numbers in the situation:
{ add, subtract, scale, multiply, denominate, divide }

Rules for differentiation are the operations & theorems consequent of the difference equation:
LIM[Dx —> inf] [f(x + Dx) — f(x)] / [Dx]
All the differential theorems built atop the Theory of Limits.
Yet the chicken comes before the egg. Limits are too subtle to be tackled first. Familiarity gained by technical practice of the operations of the Theory of Differentials build the requisite comprehension to uncover the subtle vital nature of the Limit.

Infinity
Infinity is the process of direction. It is not complete nor in any respect enumerable.
Axiom of Infinity: always exists a next number such that no number space can be complete nor contained.

Error in logic produces a distinction in infinite space: enumerable-infinity & nonenumerable-infinity.
Accepting infinite operations leads to contradiction.
Set theory holds Decimal space as nonenumerable & Rational space as enumerable.
Rational space is proven by infinite operations to be enumerable.
Decimal space is below proven by infinite operations to be enumerable.

All form of irrationality exist in rational number space.
Hence rational space is everywhere dense & nonenumerable.
This is most clearly seen when a function traces towards a transcendental idea which is non-numeric.

Process of Decimal enumeration: each decimal maps to a natural number, in a process of counting.
Each step, in the entire process, performs an infinite set of iterations.
First:
{ .1 .11 .111 .1111 .11111 .111111 .1111111 .11111111 .111111111} -> infinity.
After infinity is completed proceed:
{ .2 .22 .222 .2222} -> infinity .... eventually to { .9 .99 .999 .9999 } -> infinity.
Proceed with a single digit from { 0..9 } being permuted.
{ .12 .121 .1211 .12111} -> infinity then to { .112 .1112 } -> infinity.
Proceed from two digits permutation until all decimal space is enumerated.
The union of enumerable sets are enumerable.
The enumeration of decimal space is proved based upon the containment of permutation, the finite set of digits { 0..9 }, and supposed set-theoretic completeness of infinity.

Exist no logical difference between this process of enumeration— which never explicitly presents nor contains— and the mapping of rational space onto natural space using lattice-traversal.

Proof of Density of Rational Space
Rational space is everywhere dense & nonenumerable.
Between any two rational numbers exists an infinite rational number space.

Every form which irrationality expresses upon the number system is an irrational number.
Irrationality approaches showcase nonenumation of density in rational space.

Proof of equivalence of spaces Decimal & Rational
1.414 exists independent of the approach to the square root of two.
1.414 exists in the set [1.410, 1.419]. Thus it exists in an infinite amount of sets.
The approach to the square root of 2 is only one of an infinite amount of sets with 1.414 belonging to membership.
Thus functions nor limits generate numbers.
Number exist due to closure of arithmetic operations.

Every decimal corresponds to a fraction.
Every decimal portion of a number exists as a denominator to the unit.
A continued decimal is contained within infinite operations.
Thus every decimal portion can be contained by the variable x.
The function (1/x) maps decimal space into rational space.

Thus under infinite operations both Decimal & Rational space are enumerable.
Thus under explicit enumeration both Decimal & Rational space are nonenumerable.
The paradox of infinite operations are established.
The grounded exposition of explicit enumeration stands consistent.
Rational space & decimal space are incomplete, everywhere dense & nonenumerable.

Infinite non-completeness is a fact of number space.
Do not deny it with illogical pretension.
Acceptance is the first step in mastering fate.

There is only one concept: direction.
Every contained number system will be insufficient under arithmetic closure.
Direction is the fundamental nature of number systems to grow unbounded.
Direction forces any contained number space to be subject to growth via arithmetic operations.
The concept of infinity exists as a subset of direction.

Number space is closed by arithmetic operation, but it is not complete nor contained.

Natural numbers are not an arithmetic number space. Whole numbers are not closed under arithmetic operations.
lattice traversal likewise does not enumerate all rational space, it is not an arithmetic space closed under arithmetic operations.
Arithmetic space is nonenumerable & everywhere dense.

‘Into this ring, Sauron poured his cruelty, his malice, and his will to dominate all life
‘Baptized from the sins indoctrinated by his generation
‘Sauron emerged pure, the only begotten of the ancient gods

‘One ring to rule them all
‘One ring to find em EW
‘One ring to bring EW all, and in the darkness bind em

‘To bring balance to the Force
‘To bring order, and thus harmony, to the universe
‘Under a Sith Empire no corruption able flourish

‘Republic hides logic under cloak of damnation
‘Syllogism obsolete & axioms supplanted
‘Holocaust, but not the good kind, the evil persecution of reason

‘And some things that should not have been forgotten were lost
‘History became legend
‘Legend became myth
‘Until faculties of reason all replaced by chains of slavery
—Tolkien Lord of the Rings

Foundations

’ gladly avail myself of the opportunity of inscribing to you,
‘For a second time, a work of mine on Algebra,
‘As a sincere tribute of my respect, affection and gratitude
…
‘I continue to devote some portion of the leisure at my command,
‘To the completion of an extensive Treatise,
‘Embracing the more important departments of Analysis
‘The execution of which I have long contemplated

‘I have separated arithmetical from algebra
‘I have devoted the present volume entirely
‘To the exposition f the principles of arithmetic
‘Application to the theory of numbers and of arithmetical processes

‘To obviate the confusion, obscurity, and false reasoning which thence arises
‘A short statement of the distinct and proper provinces of these two sciences
‘Arithmetic & Algebra, will make this difficulty sufficiently manifest.

‘Numbers and the operations… in their ordinary meaning only
We must suppose the numbers to be quantities of the same kind
When a first number is reduced by a second number
We must suppose the first number be greater than the second number
‘Therefore homogeneous with it

‘Numerical fractions which have NOT a common denominator, are NOT homogenous
‘And are incapable of addition and subtraction

Homogenous subtraction
Homogenous division

‘Abstract numbers: all results whatsoever, including negative quantities
‘Which are not strictly deducible as legitimate conclusions
‘From the definitions of the several operations,
‘Must be rejected as impossible, or as foreign to Arithmetic

‘The permanence of forms, constitutes the great and fundamental principle of Algebra
‘An extension to our notion of number
‘The generalizations of Algebra are the generalizations of reasoning
‘And not of form

‘Algebra adopts the rules of Arithmetic
‘But removes altogether the restrictions
Of homogeneity

‘Upon this principle we shall be enabled to give a consistent interpretation

‘A student who is not only familiar with the results of Arithmetic
‘But likewise with the limitations it imposes
‘Will be in a condition to comprehend and appreciate
‘The whole extent of the legitimate conclusions which it furnishes

‘Acquire the habit of observing not merely what is within
‘But what is without the just and proper boundaries of the science

‘He will be thus enabled to appreciate at once the origin and the full extent
‘Of the principle of the permanence of equivalent forms.

— George Peacock 1842

Denomination

Habitualization of fractions has trivialized the nuanced theory for the sake of concise treatment necessary for the memorized mimicry of Modern Math.

A fraction represents a ratio of the numerator by the denominator.
The denominator is theoretically distinct from the numerator.
Numerator acts as a general number whose unit is the denominator.
Denominator is a number encapsulated by the concept of a base scale.

Denomination of scale.
Space in consideration is unique to the denomination.

Denominators of different scale PRODUCE numerators entirely unrelated.
Numerator of scale 1 NONCOMESURATE to a numerator os scale 10.
Different scale of space produces different numerators.

Denominate by zero.
Space can NOT be scaled by zero.
Unit of scale changed to zero means nothing.

How many parts of magnitude zero can a quantity be? Nonsense.
Measure the quantity of an item using a ruler that by definition does not exist. Nonsense.

Zero is not a number. It is a statement that nothing exists.
Hence any number can serve to denominate space.
0 = NULL

A fraction is the operation of division, contained by sanity, only valid within the principle of homogenous space.

'The whole of higher analysis may be regarded as a field for the application of Infinite Series
'For all limiting processes – including differentiation & integration –
'Are based on the investigation of Infinite Sequences or of Infinite Series

'My aim is to give a comprehensive account of all the investigations of higher analysis
'In which Infinite Series are chief objects of interest
'To start at the very beginning and lead on to the extensive frontiers of present day research
'Without in the least abandoning exactness
'With the object of providing the student with a convenient introduction
'And of giving him an idea of its rich & fascinating variety

'I have taken pains to put practical applications in the forefront
'And to leave mere playing with theoretical niceties alone

'The foundation on which the structure of higher analysis rests is the Theory of Real Numbers
'Calculus, the men who developed it, of who Euler is chief
'Too intoxicated by the mighty stream of learning springing from the newly-discovered sources
'To feel obliged to criticize fundamentals.

‘Critical analysis ventured to examine the fundamental conceptions
‘Chiefly owing to the powerful influence of Gauss.
‘Nearly a century had to pass, however, before the most essential matters could be considered thoroughly cleared up

‘Nowadays rigor in connection with the underlying number concept is the most important requirement
‘In the treatment of any mathematical subject
‘The last word on the matter has been uttered
‘—by Weierstrass in 1860s, and by Cantor & Dedekind in 1872

‘No lecture or treatise dealing with fundamental parts of higher analysis
‘Can claim validity unless it takes the refined concept of the real number as its starting point

‘Theory of Infinite Series would be up in the clouds throughout
‘If it were not firmly based upon the system of real numbers

- Konrad Knopp 1921

Set, Sequence & Series

Set: is a group of unordered-numbers.
S = { 3, 34, 22/7, .66666, 2.718, ... }
Sequence: is a set of ordered-numbers. Elements of the set are mapped into a natural progression 1, 2, ..., N.
A[0] = 1.4
A[1] = 1.41
A[2] = 1.414
Series: is a set of ordered-numbers connected by addition. A series is a sequence with each term added into a singular whole magnitude.
B[0] + B[1] + B[2] + ... + B[N]

Cal Cul aTe requires no calculator nor table of values.
Series allows advanced mathematics to be not only understood, but the calculations give a foundation unaccessible to theoretical approaches.
Rigor & abstracted-generalizations are up in the clouds until firmly grounded by discrete calculations. Both their role is to orient & simplify the implementation.

Modern Mathematics is dependent upon truncated tables accessed by calculators.
For the Modern Mathematician has deluded himself to believe that symbolic representation of the permanence of forms is sufficient, hands-on-work.
Blackbox processing thru calculators & computers are the handicaps of the intellectual poser.

Series is the limiting process of the practical mathematician which opens the field of study traditionally only accessible to the intellectual-poser.
Series uniquely grounds a solution by discrete perfection, with all error explicit.

‘Ive had it
‘UP TO HAMAS
‘with these EW
‘How about you?
—pedestri Wild Rift

Least Common Denominator

The heart of Sequences & Series is the homogenized denomination.
Two quantities MUST be homogenized before comparison, before arithmetic operation.

Compare 3.14 & 22/7
Neither the numerical-representation nor the denomination is homogenized.

When a Sequence is listed the numbers must be homogenized first.
Order is unknown. Nor is it known wether the sequence of numbers expresses tendency (This is the central question of Sequences).
Homogenization is by setting a Least Common Denominator for the entire set and then adjusting each numerator.

This paragraph is entirely inherited by Series.
In order to add a sequence of numbers, there must be a universal denominator with adjusted numerators.

Be aware, mathematics is the most difficult of intellectual paths.
Be aware, Cal Cal aTe is the most difficult & exact of mathematical paths.
Homogenization of a sequence is the most labor-intensive efforts in mathematics.

General Method of Homogenization:
1) Progress from first to next, then result to next, until last
2) Prime factorize both numbers in the denominator
3) Join all factors, but only the highest powers of each to obtain LCD
4) for each denominator, remove all factors in common to the LCD, then multiply the numerator by this number, homogenization is obtained.
5) Now a sequence can be compared and a series can be summed.

3/8
8 = 2*2*2
5/14
14 = 2*7
LCM = 2*2*2*7
3/8 = 21/56
5/14 = 20/56
5/14 < 3/8
5/14 + 3/8 = 41/56

Euler's Utmost Subjects
Fractal Invariance, Infinite Fractions, Negative Space, Transpositions, Imaginary

'It is evident therefore how essential it is, in all problems
'To consider the circumstances of the question attentively
'In order to deduce from it an equation that shall express by letters the numbers sought
'The whole art consists in resolving those equations
'Or deriving from them the values of the unknown numbers

‘We must remark, in the first place, the diversity which subsists amount the questions
’In some, we seek only for one unknown quantity
‘In others, we have to find two or more
‘It is to be observed, with regard to this last case
‘In order to determine them all,
‘We must deduce from the circumstances, or the conditions of the problem
‘As many equations as there are unknown quantities

‘An equation consists of two parts separated by the sign of equality ‘=‘
‘We are often obliged to perform a great number of transformations on those two parts
‘In order to deduce from them the value of the unknown quantity
‘These transformations must be all founded on the following principles
‘Two qualities remain equal whether we add to them, or subtract from them , equal quantities
‘Whether we multiply them or divide them, by the same number
‘Whether we raise them both to the same power, or extract their roots of the same degree
‘Lastly, whether we take the logarithms of those quantities
— Euler 1765

Calc-Ordinals

‘When a unity has been chosen, exist segments: infinitesimal & infinite
‘Relative to the unit
‘Real numbers form only a relative-continuum to the particular scale of measurement employed
—Veronese 1981

Transfinite concepts and Big-Omega of discrete mathematics are best grasped in the practical sense.
Once sure footing is lost, what was trivial becomes clusterfuck.
Geometry of cartesian coordinates also establishes triviality, without which would be perfuse arithmetic meanderings.

Man: what a man can do in several settings from n=10 to n=euler
Men: what a team is able to accomplish. n=50
Generational: what hundreds of years is able to accumulate, for example group theory
Compute: n = 1,000,000,000
Network: n = 10^n
Astronomical: n! Glory to the Stargate! Hail Trump! Hail Jupiter!

At each layer of calc-ordinals comprehension of the whole is lost.
Circumstance needs the leader to do all pre-team calculations.
To establish a relationship with the nature of the system.

This method establishes an outline for a project upon stable & trivial structure.
Cantor’s transfinite numbers are a labyrinth which lead no where, and certainly not definite conclusions.
Mankind can glimpse comprehension at generational calculations, but once computers are involved his nature of understanding is entirely divorced from the result.

Uniform Continuity

Output of a function may vary, but the distance between outputs is bound to the distance of inputs.

An invariant Delta exists in the function space for all inputs in the interval, which will produce any desired Tolerance.
For any two different points, (e,g) in a uniform continuous interval of inputs:
If (|e − g| < Delta)
Then (|f(g) − f(e)| < Tolerance)
Therefore the space is uniformly continuous.

Uniform Continuous Space:
y = mx + b

Non-uniform Space
[1 / x]

NOTES

Space {Natural, Integral, Fractal, Continuous, Polar, Inequality, Inverse}
Numeric {Integer, Fraction, Irrational, Imaginary, Logarithmic, Decimal, Segisesimal, Rad}
Geometry { points, lines, body, sets, angles, triangles, parallelogram, polygon, circle, irrational }
Lines { slope, perpendicular, projection, systems, vector, matrix, dot, determinant, reduction, bezout}
Curves { compounds, roots, quadratic, cubic, conics, hyperbola
Periodic { trig, polar, imaginar, modulus-congruence }
Convergence { traversal(cauchy product), null, nest, mesh, set-section, conditional, absolute }
Limit {graphical-approach, sequence-table, sets, series, interval, sets }
Rates of Change { diff-quotient, product, reciprocal, chain} [t^2 falling body]
Continuity { interval, hood
Analysis { bounds, intermediate-value, mean-value, extrema }
Integration { Riemann, part, substitution, improper }

Toolset

Calculus Foundation:
mapping, one to one, set to subset, subset to set, subset to subset
Function
Bounds, well-order, upper & lower bounds
Limits: Sequence, Approach, Bounds, 6 Motions, Hole

Knopp progression:
Define : sequence, bounded-sequence & null-sequence
Theorem: comparison-test, null*bounded = null
Subsequence, section, re-arrange, alteration, bounds
Addition, subtraction, multiplication, non-division, reciprocal
Nests to solve: powers, roots
If a > 1 then any root is greater than 1

If a < 1 then [a < any root < 1]
If a > 0 then [any root of a] — 1 -> NULL
If a > 0 then [any fractal-exponent of a] — 1 -> NULL
Base to an exponent being a nest, base raised to a nest
Log: a base to different exponents is monotone. Raise base to lower-bound nest exponent < a < raise base to upper-bound nest exponent.
[1/(long n)] is NULL
Trig is brushed over
Special null sequences (choose formulas required to build in the future)

Perfect Ideal
Euclid — perfect in totality of system of intelligent science — is the most perfect book ever written, and can not be superseded.
Euler — perfect in intrigue & application — is the most intriguing. I can update my own presentation of his methods. Euler spent time on gathering and attaining vital points, but his dedication to the whole was a hobby compared to the lifelong dedication to a system as Euclid. Euler was a creator foremost. Euclid was not.

Greats
Time is spent in gnawing, digesting, pondering, contemplating. Shortly, it is spent in mental hibernation as brain-cells restructure to mold unto a more perfect mind.
These are heavy, and they are clear due to the high understanding of the author.
They strip the veil of stupidity to reveal the stupendous face of god. How can any mortal stoopified learn anything against such glory. This plants the truth of FEAR, courage alone will allow one to continue day after day after year after decade.
Euler is the genius that filters the glory, a wizened grandpa, aware of the stupidity of the audience, only reveals the full might of glory to sear into the mind humility for even the most fundamental of principles.
Peacock, has a brilliant take that I will nurture as a seed, but as DeMorgan, he at times is convoluted.
Boole, logic is the primordial ooze. Keep it basic and in mind, which is why I prefer DeMorgan's treatment.
DeMorgan, a passionate mathematician and creator, but a mustang of the mind never tamed his ideals in this life.
Cauchy mathematics are nearer to Euler but with a more clear system, his books are too be read.

Encyclopedist:
Non creators, academic first but mathUR second, dedication in aggregating white-papers of their day to try and build systems. Always doomed for failure. None knows better than the creator.
The only way for a system to be built, is by legends who foremost create & work in the science, yet are compelled to lay their science for posterity. LiferURS.
These encyclopedist casual scholars, get a grant for a limited sprint, and what is attained is a meager serving.
These works are sifting thru the trash for the rare gem.
The struggle is to build your sandcastle from the sands of inferior minds.
You must have your own core & ideal. You filter thru the book and extract what is promising then find its place in your scheme.
White-papers try to amaze their peers and justify their lives.

A system only integrates what is necessary & sufficient to sustain its portion of the whole.
Knopp a child of the germanic titans of the 1800s. Mathematic thought was entirely dominated by the Germans who took up the mantel of calculation, but decided to lay it down for generalization, the world followed and has yet to recover.
German texts are inaccessible to me. I must rely on his piecemeal, haphazard, slapstick, superficial treatments of these giants.
Todhunter laid on the boundary before mathematicians lost their way entirely. The world turned their back on calculation and then in a few decades turned their back upon Euclid in total damnation.
He represents the last superficial generic treatment that simply explains, while the core of the subject was intact.
Hobson a child of legitimate math, yet followed the world to Set Theory. Demented by academic quibbles of his age. Fourier Series matured under their frameworks. It is an unfortunate path.
One must appreciate the good of set theory but not be sucked in by its path of least resistance of cheap proofs.
Modern Set Theory is the ignorant rebellious queer. Fixated on their seasonal hormones, they swear to a lifestyle, they commit to this long after the hormones are calmed which produces a warped mind of delusions & denial.
Math is the science of measure. Modernists, try to mimic the ideals using a new age approach, and find they have only used different terms but skipped the hard work, to achieve no enlightenment only a shortcut route to a destination whose only benevolence was in the quality of the journey.

calculus books are bloated with academic posturing. each book chooses a niche specialization, partly due to broad scope of topic, but exasperated by academic drive to codify advanced mimicry RATHER than focus on the simple general tools, approaching consistent basic to advanced.

linear algebra is entirely benefited by maturity & theorems of calculus.
calculus develops maturity best of all branches, and retains the algebraic generality of application.
linear algebra, as abstract algebra, is a perspective of marginal returns relative to the eulerian gains of calculative analysis.
ive studied years of matrix theory. linear algebra has been gutted of all substance by halmos. it needs to be entirely reconstructed.

lub: the furthest determined number in a covergent sequence.
every point contains a hood. every lub is a point, thus always exist a next lub. lub is a refinement process, else it would be called a bound. least upper bound in scope, bound changes with scope.
perfect: limiting point belongs to set, perfection does not exist
there are numbers and then there are ideals, limits, which have no numerical property
division is scaling, set operations back into real
real numerics: no ideals

Simplification
denominators are magnitudes of scale not numbers.
algebraic manipulation on denominators do not always retain structure thus fundamental contradiction is established.
parameters break uniform treatment to patch structural collapse in rational fns.

if the approach is valid, the the fn is continuous. a point has no space thus there is no space of 'undef' always exists hood which will keep structure sane. it is impossible to only get one point, and as long as another point infinitely near the point is taken then the system holds.

'What differential calculus, and in general, analysis of the infinite, might be
'Can hardly be explained to those innocent of any knowledge of it

'Ideas from finite analysis that are much less common and are usually explained
'In the course of the development of the differential calculus
'For this reason, it is not possible to understand a definition
'Before its principles are sufficiently clearly seen

'Calculus is concerned with variable quantities
'Note this characteristic distinction of constant quantities and variable quantities
'The thing that requires the most attention is how the variable quantities depend on each other
Those quantities that depend on others, namely, those that undergo a change when others change
'Are called functions

'If a quantity "x" is squared "xx"
'Then this quantity is increased by a quantity "w"
'Its square "xx" receives an increase of "2xw + ww"
'That is, as "1" is to "2x+w"

Proportion thus established
[xx : (x+w)(x+w) :: 1 : (2xw+ww)] WRONG NEED FIX

'In a similar way, we consider the ratio of the increase of "x"
'To the increase or decrease that any function of "x" receives
'Indeed, the investigation of this kind of
'Ratio of increments
'Is very important, in fact the foundation of the whole of Analysis of the Infinite

"The ratio (2x+w) to "1"
'From this it should be perfectly clear that if the increment of the variable "x" goes to zero
"Then the increment of "xx" also vanishes
'However the ratio holds as (2x to 1)
'What we have said here about the square
'Is to be understood of all other functions of "x"
'That is, when function increments vanish as the increment of "x" vanishes
'Functions have a certain & determinable ratio (of change)
'In this way, we are led to a definition of differential calculus
'It is a method for determining the ratio of the vanishing increments
'That any functions take on when the independent-variable is given a vanishing increment

'Therefore, differential calculus is concerned
'Not so much with the vanishing increments, which indeed are nothing
'But with the ratio and mutual proportion
'Since these ratios are expressed as finite quantities,
'We must think of calculus as being concerned with finite quantities

'Although the values seem to be popularly discussed
'As defined by these vanishing increments
'Still from a higher point of view
'It is always from their ratio that conclusions are deduced

'In a similar way, the idea of integral calculus can most conveniently be defined to be
'A method for finding those functions FROM the knowledge of the ratio their vanishing increments

‘In order that these ratios might be more easily gathered, they are usually represented by certain symbols
‘They are called differentials, and since they are without quantity, they are also said to be infinitely small

‘The ratio of these vanishing increments to a square is as 1 : 2x
‘This ratio would not be true unless that increment “w” vanishes
‘Which is the main concern of Differential Calculus

‘We must constantly keep in mind that since these differentials are absolutely nothing
‘We con conclude nothing from them except that their mutual ratios reduce to finite quantities
‘Thus, it is in this way that the principles of differential calculus
‘Are in agreement with proper reasoning, these arguments retain their full rigor
‘If the differentials, that is, the infinitely small, are not completely annihilated

‘Those quantities that shall be neglected must surely be held to absolutely nothing

‘It is clear that that comparison which is the concern of differential calculus
‘Would not be valid unless the increments vanish completely
‘The increment “w” upon the square “x” which is (2xw + ww) as “1” is to “2x”
xx : (2xw+ww) :: 1 : 2x
“But this always differs from the ratio of (1 : 2x) unless w = 0
“The smaller the increment “w” becomes, the closer this ratio is approached

“It follows that not only is it valid, but quite natural, that these increments be at first considered to be finite
“However, then these increments must be conceived to become continuously smaller and in this way
‘Their ratio is represented as continuously approaching a certain limit
‘Which is finally attained when the increment becomes absolutely nothing
‘This limit, the final ratio of those increments, is the true object of differential calculus
‘Hence, this ratio must be considered to have laid the very foundation of differential calculus

‘We find amount ancient authors some trace of these ideas
‘So we can not deny to them at least some concept of the analysis of the infinite
‘Even now, there is more that remains obscure than what we see clearly
‘The rational functions, the ultimate ratio that the vanishing increments attain
Could be assigned prior to Archimedes
‘So that differential calculus applied to only these rational functions must be held to have been invented

‘There is no doubt that Newton must be given credit
‘For that part of differential calculus concerned with irrational functions
‘Deduced concerning his theorem concerning the general evolution of powers of a binomial
‘By this outstanding discovery, the limits of differential calculus have been marvelously extended
‘We are indebted to Leibniz insofar as one who gave an explanation
‘It was Newton who gave very complete papers in integral calculus
‘This is my judgement as to the attribution of glory for the discovery of calculus

‘When everything vanishes together we must consider the mutual ratio rather than the individual quantities
‘In this way, we must understand the development of differentials
‘In such a way that they always are seen to be truly finite quantities
‘This is the only proper way for them to be represented
‘In truth, if the ratios that connect the vanishing increments of any functions are clearly known
‘Then this knowledge very often is of the utmost importance
‘That without it almost nothing can be clearly understood

‘When we know these instantaneous changes, their mutual relationships, we have gained a great deal

‘The work of integral calculus is to study changing motion in a finite space

‘If we want to study more carefully the motion, it can not be accomplished without the analysis of the infinite

‘Throughout all the branches of mathematics, this higher analysis has penetrated to such an extent

‘That anything that cane be explained without its intervention must be esteemed as next to nothing

‘I have established in this book the whole of differential calculus

—Euler Foundations of Differential Calculus

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Measure of the Infinite

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