TIMES

THE

BOOK

OF

TIME

SOME BASIC FACETS of TIME

It is clear that the word *time* is used to cover many experiences and many phenomena.

1) Time assymmetry Past/Future
   - The arrow of time
   - Differences between past and future
   - Causality and Finality
   - Memory, recollection, vs. Vision, imagination
   - Role of Belief
   - Verb tenses

2) Time Present and not-Present, Now/Then
   - The present, "width" of now, temporal resolving power
   - Present, determinator, decker
   - Determinism and open endedness
   - Verb modes

3) Time and Eternity
   - Outside of time, Archimedes' point of view
   - The phenomenon of "recognition" (as opposed to recollection)
   - Beginnings, endings, and no-beginnings, no-endings
   - Everywhen and Nowhen

4) Time and Energy
   - Time: quantity and quality, duration and "windows"
   - Chronos: time; Kairos: timing linear & cyclical time
   - Heisenberg's time x energy = h
   - Energy transferred in the present, information transferred in future
   - Power of Belief, power of imagination
   - Objective (clock) time and Subjective (mind) time

5) Time and Template
   - Time as the third element of energy and information
   - Time as the source of dynamic
   - Aristotle's or change time, Kepler's or density time
   - Other dimensional times

CHON the ubiquitous cosmic clocks

In the evolution of the universe a sequence of clocks were used. 1° Planck's clock ~ 10^{-42} sec; baryon clock, atomic clock, ...

The Book of Time

PERSPECTIVES OF TIME

TIMCNTRL.p51 DISK: JOURNYEAR02 March 1, 1990

THE BOOK OF TIME

1 The Experience of Time
- 1.1 Psychological or Subjective Time
  - duration and interval, 'during and until'
- 1.2 Physical or Objective Time

2 The Species of Time
- 2.1 Dyadic Times
  - 2.1.1 Cyclical / Linear
  - 2.1.2 Secular / Liturgical
    - Sky time and Earth time
  - 2.1.3 Eliade: Sequential / Primordial — CHRONOS/KAIROS
    - The 'Moment' vs Eternity
  - 2.1.4 Natural / Empathetic
  - 2.1.5 Milne:
  - 2.1.6 Hinton:
  - 2.1.7 Kepler: Second Law / Third Law — SCHUSTER
  - 2.1.8 Velocity / Density (light / heavy) — MOTION TIME w DENSITY OR KEPLER TIME
  - 2.1.9 Figure / Ground
    - Slow and Fast universes,
    - Parmenides / Herakleidos
- 2.2 Triadic Times
  - 2.2.1 Bennett: Successive / Eternity / Hyparxis
  - 2.2.2 Ouspensky:
  - 2.2.3 Rifkin: Natural / Factory / Computer
- 2.3 Other Times
  - 2.3.1 Minkowski: Space-time
  - 2.3.2 Monastery time / Clock time
  - 2.3.3 Dunne: Infinite Regression

3 The Parameterization of Time
- 3.1 Past, Present, Future
- 3.2 Now, Decker, Determinator
- 3.3 Cycles and Rhythms
  - 3.3.1 Period, Frequency, Amplitude, Phase
  - 3.3.2 Harmonics and Timbre
    - The relation to music
  - 3.3.3 Coherence (phase) and Commensurability (frequency)
  - 3.3.4 Continuity
- 3.4 The 'Drummers'
  - 3.4.1 The Sun, The Moon, The Earth — THE WEEK
    - The Year, The Month, The Day
  - 3.4.2 Longer Cycles
    - Precession, Inclination, Eccentricity
    - Galactic Rotation, The Big Bang
  - 3.4.3 Shorter Cycles
    - Atomic times, Planck time
  - 3.4.4 CHON, the ubiquitous zeitgeber, Infra-time

4 The Measurement of Time
- 4.1 The Calendar
  - 4.1.1 The Seasons
  - 4.1.2 The Analemma
- 4.2 Clocks
  - 4.2.1 The divisions of the day
    - Civil, Military, Maritime, Liturgical

5 Models and Theories of Time
- 5.1 Determinism, Probalism, Teleology
  - causalism / finalism
- 5.2 Predictability and Computability
- 5.3 The arrow of time
  - The second law of thermodynamics
  - Clades
  - Hoyle's 'cone-ladder'
- 5.4 Charge-Parity-Time

6 Time and Life
- 6.1 Coherence and ageing
- 6.2 Maxwell's Singular Points — ARCHETYPES
- 6.3 Time and the Earth

7 Aphorisms

J%YCNTR2.P51 DISK: TIME&SPACE April 26, 1991

THE BOOK OF TIME

Life, Earth, and Universe are partners pulsing in unison to create an organic whole through rhythmic bonds.

Instead of perceiving time as an attribute of matter, we now perceive the material world as an expression of a more fundamental temporal reality. The infrastructure of the world is not matter, it is rhythm.

The worldview of an individual and of an age, i.e. the perception of life and things preferred, is essentially a view of time. — J.T.Fraser

Whether sacred or secular every calendar expresses the essential politics of a culture. No other device is as critical as the calendar in forging a sense of group cohesion.

CHRONOLOGY: THE TIME OF THE ASTRONOMER
- TIME AND THE EARTH
  - THE EARTHS ORBIT
  - THE PRINCIPAL CYCLES
    - EARTH: DAY, MOON: MONTH, SUN: YEAR
      - THE SUBDIVISIONS: THE WEEK, THE SEASONS
    - THE LONGER CYCLES
      - PRECESSION, INCLINATION, ECCENTRICITY
      - GALACTIC ROTATION, HUBBLE TIME
  - THE ANALEMMA
  - MANIFESTATIONS OF THE CYCLES
    - THE SEASONS: NORTH-SOUTH AND EAST-WEST
- THE MEASUREMENT OF TIME
  - CALENDARS: CIVIL AND ECCLESIASTICAL
    - THE PROBLEM OF COMMENSURATION
    - LUNAR AND SOLAR
    - NEW YEAR DAYS
    - VARIOUS CULTURES AND TRADITIONS
      - EGYPTIAN, GREEK, ROMAN, JULIAN, GREGORIAN
      - CELTIC, HEBREW, CHINESE, MAYAN, OTHER
  - CLOCKS:
    - DIVISIONS OF THE DAY
      - CIVIL, MONASTIC, NAUTICAL, MILITARY
    - MACRO CLOCKS:
      - THE THREE COSMIC CLOCKS
      - RADIOACTIVE DECAY CLOCKS
      - CARBON DATING
      - TREE RINGS
    - MICRO CLOCKS:
      - ATOMIC CLOCKS
      - PLANCK TIME

SPACE-TIME: THE TIME OF THE PHYSICIST
- ON CYCLES AND WAVES
  - FREQUENCY, AMPLITUDE, WAVELENGTH, PHASE
  - COHERENCE (PHASE), COMMENSURATION (PERIOD)
- MINKOWSKI'S SPACE TIME
  - CONTRACTIONS, DILATIONS, AND INVARIANCE
- THE ARROW OF TIME
  - THE SECOND LAW OF THERMODYNAMICS
  - CLADES
  - HOYLE'S "CONE LADDER"
- CHARGE•PARITY•TIME

CHAOS & TIME

BIO-RHYTHMS: THE TIME OF THE BIOLOGIST
- TIME AND LIFE
  - CIRCADIAN AND OTHER RHYTHMS
  - AGEING AND COHERENCE
- CHON, THE UBIQUITOUS ZEITGEBER

PITCH, RHYTHM, AND TIMBRE: THE TIME OF THE MUSICIAN
- PITCH: INVERSE TIME
- RHYTHM: TIME AND FREQUENCY
- TIMBRE: HARMONICS EVEN AND ODD
- THE SPECIES OF SCALES
  - THE CIRCLE OF FIFTHS

SUBJECTIVE TIME: THE TIME OF THE PSYCHOLOGIST
- THE EXPERIENCE OF TIME
- THE PERCEIVED PRESENT: THE WIDTH OF NOW
- DURATION AND INTERVAL: DURING AND UNTIL
- THE PAST AND MEMORY
- THE FUTURE AND PRECOGNITION
- CONTINUITY AND DISCONTINUITY IN TIME
- MARCHING TO THE RIGHT DRUMMER
- BEING ON TIME
- RIFKIN: NATURAL TIME, FACTORY TIME, COMPUTER TIME

SACRED TIME: THE TIME OF THE THEOLOGIAN
- SKY TIME AND EARTH TIME
- SECULAR TIME AND LITURGICAL TIME
- THE QUALITY OF TIME
- CYCLICAL AND LINEAR TIME — KAIROS and CHRONOS
- TIME AS MYSTERY
- THE FUTURE VS. PARAWORLDS AS THE DEPOSITORY OF HOPE

WHAT IS TIME: THE TIME OF THE PHILOSOPHER
- THE SPECIES OF TIME
  - SUBJECTIVE AND OBJECTIVE TIME
  - LINEAR TIME AND CYCLICAL TIME
    - TEMPORAL RESOLUTION AND THE QUALITY OF TIME
  - THIS MOMENT AND PRIMORDIAL TIME
  - HISTORICAL or SEQUENTIAL TIME AND PRIMORDIAL TIME
  - CONTINUOUS AND DISCRETE TIME
  - MOTION TIME VS DENSITY TIME
- PARAMETERIZATION OF TIME
  - LANGUAGE AND TIME — SLAVONIC PERFECTIVE AND IMPERFECTIVE TENSES & MOODS
  - PAST•PRESENT•FUTURE
  - UNTIL•DURING•AFTERWARDS
  - MANIFEST AND UNMANIFEST - HOPI
  - NOW, DECKER, AND DETERMINATOR
  - SLOW AND FAST UNIVERSES (SYSTEMS)
    - TEMPORAL GROUND AND FIGURE
- MODELS AND THEORIES OF TIME
  - DETERMINISM, PROBABILISM, TELEOLOGY
  - CAUSALISM AND FINALISM
  - PREDICTABILITY AND COMPUTABILITY
    - CHAOS AND CELLULAR AUTOMATA
  - REVERSIBILITY OF TIME
- CONTRIBUTORS
  - HERAKLEIDOS AND PARMENIDES
  - AUGUSTINE
  - KEPLER
    - SECOND LAW TIME AND THIRD LAW TIME
  - GALILEO AND NEWTON
  - MAXWELL: SINGULAR POINTS —— Minkowski
  - DUNNE: INFINITE REGRESSIONS
  - MILNE 2 times
  - HINTON
  - OUSPENSKY
  - BENNETT: SUCCESSIVE, ETERNITY, HYPARXIS
  - RIFKIN
- APHORISMS

Trying to explain the sacred character of certain places and certain times with new myths is fruitless

TIMEQUAL.WP6 DISK: January 20, 1994

THE QUALITY OF TIME

Some Possible approaches to a theory for the quality of time.
Time and energy are complementary. There is a trade-off between them as is formulated in Heisenberg's Uncertainty Principle.

$$E \times T > \hbar$$

It is well known that energy has *quality* as is measured by its entropy. The complementary nature of energy and time infers that time also has *quality,* although its measure is uncertain. The ability of humans to dialate and compress subjective time with respect to clock time may be related to the quality of time. Humans can evidently lock in to different zeitgebers [For example, the Fermionic zeitgebers associated with lepton, baryon, and atomic clocks, (see ZEITGEBER.WPW SCRAPS 93, #38) operating on the order of 1/8 sec, 3 milliseconds, and 2 hours]. When time has high quality, and we are "in the moment", we like to engage a high resolution short period zeitgeber. At other times we coast along "asleep" with low resolution zeitgebers. [Gurdjieff's wake state may be when we are operating with a baryon zeitgeber.] Also the rate of compression or dilation of time (i.e. of the zeitgeber period) may have a relation to what we perceive as the quality of time, as for example, the psychological phenomena associated with SAD (Seasonal Affective Disorder) as the apparent solar day changes its period. There are also the effects of phase shift as encountered in jet lag.

TIME & SPACE

TIME4.WP5 DISK: JOURNYEAR02 March 1, 1990

APHORISMS RE TIME:

Time is what is measured by a clock.
Bridgeman

Only those who are in tune with nature's time can effectively control their lives.
Li Kiang

A new model of time is required ~~if we are~~ to subsume the totality of ~~our~~ human experience.
Li Kiang

If we are to resacrilize life, we must first resacrilize time.
Rifkin, Time Wars p4

Time is not a sensory experience. It is only <u>inferred</u> from sensory phenomena.

In my view the key to comprehending space and time is the obvious fact that space is the relationship between things and other things while time is the relationship between things and themselves.
Guy Murchie, The Seven Mysteries of LIfe, p331

If there were no things there would be no space; if there were no changes in things there would be no time.
J.B. Priestley, Man and Time p104

Everything may change, but unless the changes take place at very different speeeds we could not be aware of any of them.
J.B. Priestley, Man and Time p66

Wahrheit ist komplementar zu Klarheit. ~ clarity
There is a trade-off between precision and truth.
J.B. Priestley, Man and Time p99

Instead of perceiving time as one of the attributes of matter, we now perceive the material world as merely an expression of a more fundamental temporal reality.
Rifkin, Time Wars p34

The Weltanschauung of an individual and of an age, i.e. the perception of life and concept of things preferred, is essentially a view of time.
J.T. Fraser, Time Wars p7

The most important ingredient in a worldview is its perspective on the nature of time.

Time is cyclical. Its quantity is measured determined by counting whole cycles, its quality is determined by looking within a cycle.

Li Qiang

The infrastructure of the world is not matter it is rhythm.

WHAT IS TIME?

ON THE IMPORTANCE OF TIME

The worldview of both an individual and of an age, i.e. the perception of life and the conception of things preferred, is essentially a view of time.

J.T. Fraser, Time Wars p7

ON ATTRIBUTES OF TIME IN THE PHYSICAL WORLD

The key to comprehending space and time is the obvious fact that space is the relationship between things and other things while time is the relationship between things and themselves.

Guy Murchie, The Seven Mysteries of Life, p331

A CLASSICAL THEOLOGICAL VIEW

The Creation in time is a revelation of the eternal acting of God.

St. Albertus Magnus

A CLASSICAL SCIENTIFIC VIEW

Time is what is measured by a clock.

Bridgeman

A MODERN THEOLOGICAL VIEW

If we are to resacrilize life, we must first resacrilize time.

Rifkin, Time Wars p4

A MODERN SCIENTIFIC VIEW

Instead of perceiving time as one of the attributes of matter, we now perceive the material world as merely an expression of a more fundamental temporal reality.

Rifkin, Time Wars p34

TIME TRANSCENDS THE PHYSICAL WORLD

Time is not a sensory experience. It is only <u>inferred</u> from sensory phenomena.

If we ask a physicist, does space have quality? He or she would probably not know what we meant, but would say that space has size and dimensions, attributes that we can measure, but space having quality? Does that mean anything?

If we ask an architect, does space have quality? He or she would probably say, that's how I make my living, shaping the quality of space. It is my job to make space as useful, beautiful, and interesting as possible.

Similarly with regard to time.

Ask a physicist, does time have quality? Again the reply would probably be, what do you mean by that? Time has duration and we can measure that, but quality?

Ask a musician, does time have quality? He or she would say that's how I make my living--organizing the qualities of time into pleasing, arousing, or quieting patterns.

The space and time of the physicist has only those attributes that can be measured by meter sticks and clocks. The space of the architect and the time of the musician also can be measured by meter sticks and clocks, but possess other qualities which can be experienced, felt, and described, but not measured.

Whitehead said that nothing can be experienced which does not recur and nothing can be measured which does not recur regularly. Since more recurs that recurs regularly, it follows that we can experience more than we can measure and that the world of the physicist is a restricted one.

. . . . . .

With the architect and the musician we experience quality in space and in time. The quality of space varies from place to place, and the quality of time varies from day to day. Each moment is not the same as every other moment, (except possibly to a ball rolling down an inclined plane). So what determines the quality of space and the quality of time? What are the tools the architect uses to shape the quality of space and the musician uses to shape the quality of time?

But prior to the architect shaping space, the earth has already shaped it, and prior to the musician shaping time, the earth and sky have already shaped it. The tools of the earth for shaping space are the distribution of matter and energy, the tools of the earth and sky for shaping time are light and rhythm, the beat of various drummers. These effect the basic feng shui of space and of time.

T&S

JY1NATUR.P51 NATURE OF TIME JOURNYEAR01 08/09/86

Time in its fullness is like music. There is not only length, there is height, depth, breadth, timbre, harmony, pattern, and rhythm. It is only duration that is measured by the clock. The Newtonians not only taught us that the earth was round, but taught that time was linear. The relativists permitted time to be curved in so far as it was a component of space-time which was explicably curved, But curvature adds little to the length or duration. It does not encompass those components of space and time unmeasured by the meter stick or clock. Though such bare-boned descriptions are useful in themselves, they must never be substituted for the wholeness nor richness of the structure of the world.

Number, form, space, time all possess properties beyond the arithmetic, geometric, topological and temporal.. Chronus also contains chromos. The gloaming can still cause us to pause in whatever we are doing and partake of a moment of peace. It is as though each of us faintly recalled another world where true peace and joy once permeated our lives. Taking the color or timbre out of time has all but removed the magic and wonder of the seasons. A dim vestige still remains for us in the Season of Lights--Christmastide. In spite of all of the secularization of time we still know at a deep level that time has quality and that this quality requires us to respond correctly to its varying nature if we are to live in harmony. Even the physicist admits to the existence of "launch windows", proper periods of time when something must be done if it is to be effected at all.

Calendars have become in our culture but counting devices to inform us how far we have travelled in time from New Years day. In this the calendar is like the odometer of a car, telling us how far we have travelled, but nothing about the country through which we are travelling. Linear time contains nothing of the amplitude, phase, periodicity or timbre of time. The calendar at least restores the attributes of periodicity and phase, but still omits the amplitude and timbre. The beats between the different cycles of day, month, and year are not recorded, nor are any of the modulations imposed on the basic cycles by higher harmonics. Our calendars should tell us the quality of time, as did the calendars of ancient peoples such as the Maya. Fascination with precision in measurement is not an excuse to ignore qualitative factors which may be prove more helpful to recognizing the tunes being played than just listening to the metronome.

Tasks have their own characteristic times. One of the first requirements in designing any task is to identify its characteristic times. This does not mean only the time taken to complete the task but also the proper sub-intervals or temporal modules consistent with the task and the proper time to undertake the task.

In physics the effects of the interactions of "natural" periods and imposed periods are well understood. Only when the imposed or forced period coincides with the fundamental or one of the harmonics of the natural period of the system will resonance be possible. Otherwise damping, hunting,beats and wasteful irregular

dissonances occur. (like hypoglycemia). Therefore work should be designed around an understanding of the natural periods involved. If we are not to initiate dampoits and the damaging effects of large amplitudinal swings, the actual temporal modules must be made to coincide with the workers intrinsic frequencies and the task frequencies. Nine to five may be absolutely disastrous in optimizing effectiveness--(story of the admiral at Mare Island in WWII)

The reason life advanced on earth was the resonance of the geophysical periods and the intrinsic clocks of circadian an other rhythms The basis of CHON. One suspects that resonance is an organizing principle basic to all others. eg such concentrative forces as gravitation, coulomb, gregariousness are attributes of resonances between certain oscillations.

The circular or cyclical image of time:
Focusing on each part of the cycle at its proper season is far more conducive to here and now presence and consciousness than operations based on the linear image of time which focuses not on what is being done now, but on some yet to come state next week when, when I graduate....

TIME3.P51 T+S
12/05/89 Some notes on Time

We experience time as linear--the moving finger writes, and having writ moves on; again we experience time as cyclical--the sky turns, the earth moves in its orbit and the seasons come and return. In order to reconcile these linear and cyclical experiences of time we have envisioned time in the form of one of those continuous curves which combine both line and circle--the spiral or the helix. But can a spiral or helix account for all of our experience of time? Continuity is the essence of a reality, but if realities interact there must be discontinuities. To account for our full experience of time we must allow for those instants which detach themselves from the steady advance of the clock, the moments when discontinuity is interjected--those instants blanked to our consciousness and those instants which partake of eternity.

In one model of the atom, the electrons are represented as particles orbiting the nucleus planetwise. But energy may leave or enter the system altering the orbiting configuration and this always occurs in a discontinuous manner. Upon interaction with the outside, the electrons do not spiral, but jump from one orbit to another, moving discontinuously from one continuous configuration to a different continuous configuration. What is omitted from our spiral and helical modals of time is the ocurrence of discontinuities as when a packet of energy enters or leaves the atom.

While a spiral may provide an appropriate model for growth ocurring through seasonal cycles or even a model for adaptive evolutionary change, it does not model extinction or emergence and like events involving interaction with context. If left alone a system may move on a circle or spiral, ~~but if~~ but if something is incarnated from outside--such as an hv packet of energy--a transformation results.

Again metaphorically exploiting the atom, in order for interaction to take place, the system and the incoming energy must be in tune. The frequency, v in the energy packet must match the frequency of the electron orbit in order for a transformation to take place. And so it is with the Journey of the Year, there must be a tuning of the human soul with the incarnating spiritual essence before transformation con take place.

Created: 12/5/89 Modified: 12/5/89

T+S

TIME1.WP5 DISK: JOURNYEAR02 JANUARY 4, 1990

Some notes on Time, Cycles and Spirals

In our ageing and in the laboratory we experience time as linear--the moving finger writes, and having writ moves on. But in the seasons and in the manifestations of life itself we experience time as cyclical--plants sprout, grow, mature and die then are reborn, sprout, grow, mature and die. All things animal, vegetable, mineral--whether they are humans, trees, mountains or even stars--age and decay, yet all are reborn and move endlessly through the cycle of birth and death. The linear facet of time appears to derive from the pervasive presence of the Second Law of Thermodynamics while the cyclical facet seems to originate with the forces of plenitude and preservation.

One device which we have employed to represent phenomena subject to these two aspects of time is to map them onto a continuous curve, such as a spiral or helix which combines both line and circle. This is adequate so long as only continuous processes such as growth and decay are involved and nothing new is created. But spirals and helices cannot do justice to creation, emergence or to transitions between levels. Continuity is the essence of a reality and continuity restricts us to a single level or single reality. In order for two levels or realities to interact there must be some break in continuity. But in our experience of time do we not also experience moments of discontinuity? Those instants of time detached from the steady advance of the clock in which our consciousness is blanked or in which our consciousness is released and we partake of eternity.

We have a physical example of discontinuous action between levels in the Bohr model of the atom. In this model electrons are represented as particles which planetwise orbit the atomic nucleus. But energy may leave or enter the system altering the orbiting configuration and this always occurs in a discontinuous manner. Upon interaction with energy to or from the outside, the electrons do not spiral, but jump from one orbit to another, moving discontinuously from one continuous configuration to a different continuous configuration. It is this type of activity that is precluded in spiral and helical representations of change. While a spiral may provide an appropriate model for growth ocurring through seasonal cycles or even a model for adaptive evolutionary change, it does not model transformation, emergence or extinction or events involving interaction with other levels. If left alone a system may move on a circle or spiral, but if something is incarnated from outside--such as an hv packet of energy as in the case of the atom--a transformation results.

We may further appeal metaphorically to the atom. In order for an interaction to take place, the system and the incoming energy must be in tune. The frequency, v, in the energy packet must match the frequency of the electron orbit or no transformation can take place. And so it is with all change beyond growth and decay. There must be a tuning between the seed, psyche, or soul, and the incarnating life essence, information, or divine spirit before transformation can take place.

updated

JOYOUTL2.P51 DISK T&S AGW 11/12/87

THE TENSIONS: NATURAL TIME vs. SECULAR TIME

Man lives in a schizophrenic middle kingdom where biological physical time clashes with cultural industrial time. We ever seek to claim our independence from the great temporal symphony that orchestrates the world we are fashioned from.

Statistics tell the grim story of a civilization hell-bent on saving time on the one hand while eliminating the future on the other.

The artificial time worlds we have created have been accompanied by new values: efficiency, punctuality, regularity, predictability. They have undermined spontaniety, reflection, playfullness and choice.

What time we do have is chopped up into timy segments each filled in with prior commitments and plans. Discretionary time, once a mainstay, an amenity of life, is now a luxury.

and unfragmented time

CYBERNETICS OF TIME

The error signal between the is time of factory schedules, nine to five, rush hour, and the ought time of the earth's rhythms and our own biological clocks has created a tension which has been the source of mental and physical disease.

(or its beat with natural clocks/hours)

EXAMPLES OF THE DISTORTION OF TIME

SPEED UP
- Nine to five
- 42 minute lunch
- Three day mourning

CHOPPING AND ELEMINATING
- The Sabbath
- United Nations Day
- Seasons alloted to sports

RESYMBOLIZING
- Armistice Day
- May 1
- Christmas

THOSE WHO CONTROL THE CALENDAR, CONTROL YOUR LIFE
and the clock

We can tune only to natural rhythms, though we can adapt to the factory rhythm by paying the price of irritation, frustration, and ultimately illness.

For Tim

JOYECCL.P51 DISK:JOURNYEAR03 May 6, 1991

To everything there is a season,
To every purpose under heaven there is a time.
A time to be born, and a time to die;
A time to plant, and a time to harvest;
A time to break down, and a time to build up;
A time to bruise, and a time to heal;
A time to get, and a time to lose;
A time to keep, and a time to cast away;
A time to mourn, and a time to dance;
A time to keep silent, and a time to speak;
A time to hate, and a time to love;
A time for strife, and a time for peace.

after Ecclesiastes 3:1-8

time × timing

There have always been two aspects to time: A time when-to-do and a time what-to-do, and the scriptures tell us that there is a basic link between the two. In our culture we have mostly lost the wisdom of the profound linkage between what-to-do and when-to-do it. Although we are very aware of a commanding link between what and when—the clock says 7:00 a.m. we get up, it says 9:00 a.m. we report to work, it says 5:00 p.m. we leave work—we very often find ourselves out of synch with what we feel we should be doing at the time. We have replaced the basic linkage between nature's time and our activities with a contrived link between our clocks and our schedules. These artificial when-what links have put us out of tune with the basic rhythms that govern life.

NATURAL TIME

Before we can get anywhere with the problem of our present with ourselves and the earth, we must resanctify time. To do this:

1) We must recognize the role that both time and our worldview of time play in life. The worldview of time is as important to human freedom and advancement as the worldview of the source of sovereignty.

2) We must restore quality to our worldview of time. In removing quality from time, we have removed all of the instruments of the orchestra but the metronome. In making each moment of time like every other moment of time, we have high entropy time, a time rendered incapable of energizing.

3) We must reject the linearization of time. Cyclical time emphasizes focusing on each part of the cycle at its proper season. This allows us to live in the present and to have presence. Linear time does not focus on what is being done now, but on some yet to come state. Linear time thus allows us to be manipulated.

> "People are told that in return for sacrificing their time, they will be assured accuss in the near (or distant) future to an idylic timeless kingdom"

While this is a powerful dynamic for a society, it lends itself to the enslavement of society.

4) Finally, we must honor the natural rhythms, both our own and theearth's. We must recognize them and besensitive to them before we can tune to them.

TIME & SPACE

TIME7.P51 DISK:JOURNYOYEAR 1973

Taken from the Introduction to the book, Tools of Astrology Houses. (written by Dane)

The hands of the clock display but a small part of what our consciousness experiences as the phenomenon of time. Not only can human consciousness expand a minute of clock time to what seems hours or contract an hour to what seems only minutes but our subjective experience impresses upon us the reality that time possesses much more than mere duration. Time is also rich in quality. All of us continually experience the moods of time: The cycle of the day with its changing hours of expectancy, vibrancy, stillness and gloom; the cycle of of the year with its seasons of awakening, activity, fruition and sleep; even the cycle of lunation with its more subtle phases of expansiveness, heaviness, closedness and emptyness. These cycles, through all of the nuances created by their superposition, lead us to feelings that the time may be propitious or out of sorts, focused on diffused. These basic cycles together with other still more subtle cycles provide us with the fact that, in quality two instants of time are never exactly alike, and that the common physical conception of time as linear and uniform, possessing only sequence and duration, is far too naive a viewpoint for an adequate description of the richness of the human experience of time.

The quality of time impressed itself on human awareness long before there existed adequate psychological techniques for independently measuring the states of the psyche that reflect the quality of time. Ancient peoples overcame these lacks through their adaptation of the movements and patterns in the sky for the measure of rhythms and the symbolization of psychologicl esssences. The markings in the sky were more permanent and more accurate than any available written language. They were an indelible and universal display whose observation permitted the ready retrieval of the phases of the multitudionous cycles basic to the cosmos and to life.

TIME & SPACE

TIME6.P51 DISK:JOURNYOYEAR October 3, 1990

The quality of time has to do with the interior of a natural cycle. Physics and chemistry in general do not examine interiors of cycles, they merely count cycles. It is only in biology, psychology and the social sciences that the interiors of cycles are examined. However, it is important that the cycle be a natural cycle. If the cycle is not a natural one, the quality may be scrambled and lost.

What, then, are natural cycles? We hold that for terrestial and human purposes that the day, the synodic month, and the tropical year are natural cycles. Other natural cycles derive from the beats of these cycles. On a more basic and universal level natural periods or cycles derive from the values of the fundamental constants of physics and from the electromagnetic and gravitational properties of atoms. The smallest cycle is the so-called Planck time which is of the order of 10^{-42} seconds. Other basic times are the time taken to "orbit" a proton at the electron radius when moving at the velocity of light (=), the time taken to orbit at the Bohr radius moving at the velocity of light (=), and the "Schuster time" of the hydrogen atom (=). The beats of these different times instruct the "quality of time".

TEMPDYAD.W52 DISK:TIME+SPACE February 17, 1994

TEMPORAL DICHOTOMIES

PHYSICAL TIMES

MOTION	DENSITY
ARISTOTELEAN	KEPLERIAN 2nd $T \propto R^2$ 3rd $T^2 \propto R^3$
LIGHT TIME	GRAVITATIONAL TIME
FAST	SLOW
INFORMATION	MATTER
COMMUNICATION	TRANSPORTATION
SPECTRAL LINES	G-ATOMIC
LEPTON TIME	BARYON TIME

BIOLOGICAL TIMES

NEURON TIMES	MUSCULAR TIMES
CIRCADIAN RHYTHMS	MONTHLY RHYTHMS
SUBJECTIVE TIME	OBJECTIVE TIME

CULTURAL TIMES

CHRONOS	KAIROS
SECULAR	LITURGICAL
SOLAR	LUNAR
IMPERFECTIVE	PERFECTIVE
SECULAR	NATURAL

Natural ≠ Secular
Cyclical ≠ Linear
Liturgical ≠ Kairos (ala Griffith) or Heschel)
Anniversaries - Remembrance ≠ Living Event ≠ Kairos

CONCEPTUAL TIMES

LINEAR	CYCLICAL
EVOLUTIONARY INOVATIVE	REPETITIVE ITERATIVE
HISTORICAL	ARCHETYPAL
TEMPORAL (NATURAL)	PRIMORDEAL
FREQUENCY	PERIOD
CONTINUOUS	DISCRETE
OPEN	CLOSED
SEQUENTIAL (CAUSAL)	~~PRIMORDIAL~~ TEMPORAL
PERI	DIA (synchonicity)

Creativity must have two frames of reference.--Craik

Information must have a faster rate than matter.

Is Kairos associated with density time? Both are cyclical.
Is Chronos associated with motion time? Both are linear.

CHRONOS1.P51 T&S 12/14/91

OUR TWO TYPES OF TIME

There are two kinds of time and for them we have two calendars. The first kind of time is an outer or objective time, **chronos.** This type of time is linear and its primary attribute is duration. It is scientific time and secular time and together with the common calendar is used to keep our business and social affairs coherent and synchronized.

The second kind of time is an inner or subjective time, **kairos.** This kind of time is primarily cyclical and its principle attributes are quality and propriety. It is biological time and religious time and in conjunction with liturgical calendars enables us to tune to the seasons of the year. It tells us when it is proper to be born and to die, to plant and to pluck, to weep and to laugh, to get and to lose.

Although liturgical time is inner it is nonetheless entrained by the cosmic rhythms of the earth and the sky. The turning of the earth, the motions of the sun and the moon, all supply bench marks for our inner clocks. These bench marks cannot be ignored by our inner clocks even though our secular time ofttimes denies them.

Inner time is amplified by this message from a current gift catalog.

> *The transition from Autumn to Advent is of all seasons the one in which the cycle of nature is most nearly complemented by the quickened sensitivity of the soul. The plaintiveness evoked by falling temperatures and leaves is followed up at once with the air of anticipation of Yuletide. At least this is how it ought to be. Throughout the ages, those peoples who have most finely attuned the passage of their years to the rhythms of the seasons have experienced those spiritual insights that are of the essence of civilization. The very idea of the West arose from such an experience, an experience given its most glorious expression in Europe's medieval epoch and its most singular evocation in the fertile imagination of the Celts. The richest literature, the grandest crafts, are alike informed, to at least some extent, of their mysterious interpenetration of both nature and supernature.*

CHRONOS I. P51

JOURNEY OF THE YEAR

There are two kinds of time and for them we have two calendars. The first kind of time is an outer or objective time. This type of time is regarded as linear and its major attribute is duration or interval. It is our scientific and secular time and together with the secular or common calendar is used to keep our business and societal affairs coherent and synchronized. The second kind of time is an inner or subjective time. This kind of time is cyclical and its major attribute is quality or mood. It is our psychological and religious time and in conjunction with liturgical calendars enables us to tune to the seasons of the year and the day.

Whereas psychological time is inner it is nonetheless entrained by cosmic rhythms of the earth and the sky. The turning of the earth, the motions of the sun and the moon, all supply bench marks for our inner clocks. These bench marks cannot be ignored and even our linear secular time must respect their messages. An example of such a message is contained in this quotation from a current gift catalog.

> *The transition from Autumn to Advent is of all seasons the one in which the cycle of nature is most nearly complemented by the quickened sensitivity of the soul. The plaintiveness evoked by falling temperatures and leaves is followed up at once with the air of anticipation of Yuletide. At least this is how it ought to be. Throughout the ages, those peoples who have most finely attuned the passage of their years to the rhythms of the seasons have experienced those spiritual insights that are of the essence of civilization. The very idea of the West arose from such an experience, an experience given its most glorious expression in Europe's medieval epoch and its most singular evocation in the fertile imagination of the Celts. The richest literature, the grandest crafts, are alike informed, to at least some extent, of their mysterious interpenetration of nature and supernature.*

Indeed it was the Celts, with their deep sensitivity to inner time, who supplied much of the foundation for our modern liturgical calendar. The Celts divided the year into two parts marked by the feasts of Samhain (November 1) and Beltene (May 1). The period Samhain to Beltene was winter, the period Beltene to Samhain was summer. Each of these periods was in turn divided in two by so-called 'quarter days', Imbolg (February 2) and Lughnasadh (August 1). The key day of the year was Samhain, the Celtic new year day. Samhain and its eve were a time apart from the rest of the year, a time charged with a peculiar preternatural energy. The Other World, the world of spirits, dominated all mental images and spirits moved freely among men. The normal order of the natural universe was suspended and the barriers between the natural and supernatural were removed. In this time outside of time, the setting was established for those myths which symbolize the dissolution of established order as a prelude to its recreation in a new period of time. Thus in practice Samhain became a time of unbridled carousal with strong ingredients of turbulence and chaos. But it was a time of great opportunity for those with the courage to cross the bridge to the Other World and circulate in the world of the spirits. The Sidh [dwelling place in the para-

2TIMES2.W52 DISK:T&S January 28, 1994

THE TWO-FOLD NATURE OF TIME

I am repeatedly bothered by questions such as the one posed by the nature of "density" time. It is well known that the period in many systems varies inversely with the square root of the density.

$$(1) \qquad \tau = k/\sqrt{\varrho}$$

In such systems as a pulsating star whose density varies with the period τ, what is the value of ϱ that determines the period? Another example is given by Kepler's Second Law. In an elliptical orbit, the mean density of a binary system varies with the separation of the two objects. If the period depends on the density, and the density on the separation, which density and which separation? For purposes of Kepler's Third Law, of which equation (1) is a special form, we can calibrate the periods against a specific separation or density. In the case of binaries, the semi-major axis is usually chosen. While we can answer the question of what density to choose by calibration, we have not resolved the paradox implied by equation (1) that since ϱ is different at each instant of time, τ must also be different at each instant, yet we end up with a single value for τ. Are we talking about two kinds or levels of time when we refer to $\tau(t)$, the period being a function of time? Should not equation (1) be written

$$(2) \quad \tau(t) = k/\sqrt{\varrho(t)}$$

and just what is the physical and cognitive difference between τ and t? Are we talking about the same kind of time in Kepler's Second and Third Laws?

But this is not the only instance in which we encounter a dyadic nature in time. Every physical system, in order to maintain coherence, must have a fast component and a slow component. We recognize this in artificial systems. In the 19th century, railroad operation came to depend on the telegraph, the slow trains and fast wire signals. In the 20th century we see the far more complex airline systems as totally dependent on radio communication, the slow airplanes and the fast wireless signals. And in organic systems, the nervous system operates at high speed relative to the muscular system. Throughout the universe information must move more rapidly than matter. There are fast clocks (zeitgebers) and slow clocks and both are required to tell us "what time it is".

In the 30's and 40's

The Mount Wilson astronomer, Gus Stromberg, used ~~to like~~ to point out a paradox that everybody chose to ignore. The beam interferometer mounted on the front of the 100 inch telescope allowed the diameters of near by stars to be measured. The process depended on light originating at the left limb of the star forming an interference pattern with light originating at the right limb. But Stromberg pointed out that for such an interference pattern to be possible, the atoms at the left end and those at the right end must radiate in coherence. That is, they must stay in phase, operate under the baton of the same orchestra director. But the diameter of the star was too great for the velocity of light to serve as director. So how did the atoms know what time it was? What was the fast information system that made interference patterns possible? Some second level kind of time involved?

We have long recognized that time derives from change. Aristotle, and Western scientists ever since, have centered on the particular kind of change we call motion.

$$\text{time} = \text{distance/velocity}$$

But in equation (1) we are encountering time that does not involve motion or even change. Time is a attribute of matter, in particular of the density of matter. But this is exactly what the general theory of relativity tells us. Both space and time are attributes of matter. With no matter present, there would be neither space nor time. Since frequency is the inverse of period, equation (1) tells us that frequency is proportional to the square root of density. If the density is zero, the frequency becomes zero (the period, infinite), and if the density is high the frequency becomes high (is there an upper bound?).

The two ways of looking at time, as period or as frequency, constitute another dyadic aspect of time. Here music comes to mind. Music consists of a series of events, call them notes, each with a period or duration and each with a pitch or frequency. Music is usually represented by a two dimensional device called a staff, on which the horizontal axis represents rhythm and the vertical axis represents pitch. The interesting question is where is the interface between time rates we term rhythm and those we term pitch? Pitch usually is the realm of the ear, going as low as say 30 hertz. Rhythm is the realm of feeling, going as fast as say 8 hertz. So somewhere in the neighborhood of a tenth of a second, we make a switch between period and frequency, between rhythm and pitch. It is interesting that the lepton zeitgeber (see The Zeitgebers, Scraps 93 #38) has a period of 0.120537 seconds corresponding to a frequency of 8.296 hertz. Perhaps this is the interface. Durations longer than 1/8 second we respond to as duration and

measure in seconds, minutes, ... years. Durations shorter that 1/8 of a second we invert and respond to as frequency and measure in hertz, kiloherz, megahertz, ... This seems to be the human time-frequency interface. It would be wrong to assume that other creatures and systems possess the same one.

If we take the positive axis of real numbers as a metaphor, then in the interval 1 to ∞ we express a number as n, its period or duration; in the interval 0 to 1 we express a number as 1/n, its frequency. In the metaphor the number 1 is the time-frequency interface.

We are left with the question, should we write A or B? where

$$A) \; = \tau = \frac{k}{\sqrt{\rho(t)}} \quad ; \; B) \; = \tau(t) = \frac{k}{\sqrt{\rho(t)}}$$

Writing A infers that τ, though constant in length, is in some way a function of t, that it varies from instant to instant. Since it is not the length of the cycle that varies, it is something else. Perhaps it could be a "quality" of time, a large ρ indicating one quality, a small ρ another, but with the mean value of ρ determining the length of τ.
We might then write

$$q(t) = \frac{k}{\sqrt{\rho(t)}}$$

where q(t) is a quality.

#86

Ref: 91-#5, 91-#18, 93-#6, 93-#38, 93-#42, 94-#5, 94-#6, 94-#7, 94-#10, 94-#11, 94-#12, 94-#13

2times3.w52 disk January 29, 1994

MORE ON THE DYADIC NATURE OF TIME

In considering the elliptical orbit of a binary system in terms of system density, the mass is given by the sum of the masses of the two bodies and the R used to determine the volume is the semi-major axis, which is

$$(R_{min} + R_{max})/2$$

The density so calculated gives the correct answer for the values of the period when used in Kepler's third law. Although the density in an elliptical orbit is a function of time, it is continuously varying, the period is determined by the mean value of the density. So the correct interpretation of the equation would be

$$\tau = \frac{\kappa}{\sqrt{\bar{\varrho}}}$$

where $\bar{\varrho}$ is the mean density.

In the case of a system of three bodies, how would the mean density be calculated? This question leads to the heart of the difficulties involved in solving the general three body problem. There is no such thing as a mean density in this case and the system is aperiodic. In the restricted problem of three bodies, such as the sun, earth, moon configuration, calculation of a mean value of R should be possible and the system is periodic.

possible and imaginative since

One speculative way of calculating the density would be to pass a circle through the three bodies and take the radius of the circle as the value of R. Here the smallest R would be a value close to the astronomical unit, while the largest R would be almost infinite when the three bodies were near alignment, as ~~in the case of~~ during an eclipse. Returning to the earlier interpretation of the equation, that τ is a function of t, continuously varying, then the period would become exceedingly long as the density drops toward zero ~~at the time~~ during of an eclipse. Perhaps this $\tau \to \infty$ during an eclipse participates in giving an eclipse its awesomeness.

The feeling of eternity

Use a sphere for 4 bodies

for $n > 4$, what? Best to use bounding spheres

One method of calculation for $\tau = \frac{\kappa}{\sqrt{\bar{\rho}}}$

another for $\tau(t) = \frac{\kappa}{\sqrt{\rho(t)}}$

Consider a satellite

The higher, the slower, the longer the period, the smaller the density of the system

$$\tau(t) = \frac{2\pi R(t)^{3/2}}{\sqrt{GM}} \qquad v = \frac{2\pi R}{\tau} = \sqrt{\frac{GM}{R}}$$

i.e. $\exists$ a τ corresponding to the circular orbit of radius R for a given mass

If R changes with time τ changes with time

and If ρ [illegible]

$\exists$ a set of instantaneous periods

$\tau(t)$

one kind of time — the period or cycle length is a function of ~~another kind of time~~ parameters varying with another kind of time

But t time is also counting of periods or cycles.

$\therefore$ time is a hierarchy of cycles

We count seconds to get minutes

count minutes to get hours

count hours to get days

count days to get years

TIMETYPS.P51 DISK:JOY03, TIME August 15, 1991
08/04/91

PERI-TIME AND DIA-TIME

In order to understand the Journey of the Year it is necessary to note two types of time. We may call these two times peri-time and dia-time. Peri-time is what we ordinarily consider to be time: the time measured by clocks and calendars, the time of physics, the time of history, the time possessing past, present, and future. Dia-time, on the other hand, is time outside of ordinary time. It is what Eliade called primordial time. It is the abode of archetypes, the domain of eternity.

Events are ordered in both peri-time and dia-time, but their sequence in peri-time may be entirely different than their sequence in dia-time. This may be illustrated by considering a set of events ordered numerically around the circumference of a circle. [Figure I] Say that peri-time moves from event to event in the order 1,2,3,4,... clockwise around the perimeter of the circle. While in dia-time the ordering of the same events follows that given by the directed chords, 1,4,2,8,5,7,..

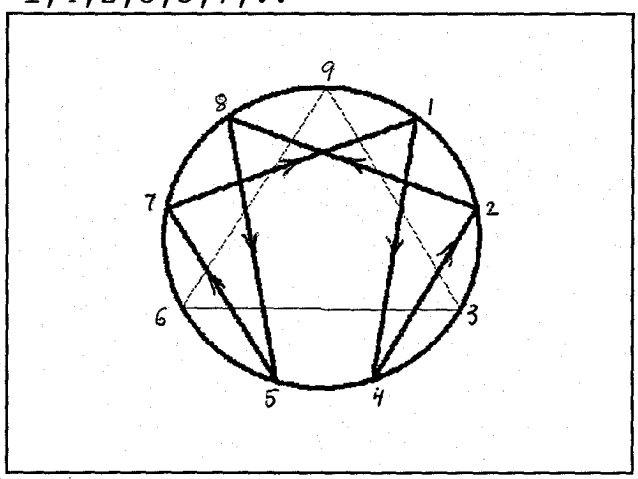


Figure I.

How proper it is that Christmas should follow Advent. For him who looks toward the future, the Manger is situated on Golgotha, and the cross has already been raised in Bethlehem.
Dag Hammarskj
Markings

If a particular order in peri-time is always followed, such as the order 1,2,3,4,... then we would say that these events form a causal sequence. That is, we would assert that if event 2 always follows event 1, then event 1 causes event 2. However, this assertion may be based on an illusion. The archetype that governs the sequence in dia-time may be the real cause of the ordering as it appears in peri-time. But if, as is customary, we call the peri-time sequence a causal sequence, then we might properly call the dia-time sequence a meaning sequence. Those events that occur on points common to both sequences, such as the numbered points in Figure I. leaving out 3,6, and 9, give rise to the phenomenon C.G. Jung called 'synchronicity'. This is a name for events connected by meaning, rather than causality. For example, in peri-time, the event 2 occurs, then 3, then 4. But in the dia-sequence, 4 supplies the meaning for the occurrence of 2 even though 4 follows 2 in peri-time.

2times4.w52 disk:TIME February 15, 1994

Motion Time and Density Time

Given a velocity and a distance, a travel time is derived by

travel time = distance/velocity

If a universal rate is postulated, such as the velocity of light, c, then a general concept of time is derived as

light time = distance/c

These travel or motion times support a "linear" concept of time. [Some motion times: light travel from sun = 499.012 seconds; light travel time of the earth's orbit = 3135.383sec = 52 minutes

A second concept of time derives from the dimensional analysis of a function of density

time = k/ √density

This kind of time supports a "cyclical" concept of time. For the earth, for example, density time is approximately 84 minutes, while motion time, $2\pi R/c$ is 0.137 seconds (~ frequency of 7.3 hertz).

These two times become numerically equal for bodies on the Schwarzschild Limit.

$GM/c^2R = 1$

For bodies with $GM/c^2R < 1$, which includes everything but black holes, density time exceeds motion time.

The formulae relating motion and density time derived from physical theory are as follows:
From the definition of density time

(1) $$\tau = \sqrt{\frac{4\pi^2 R^3}{GM}}$$

And the definition of motion time

(2) $$t = \frac{2\pi R}{c}$$

We derive

(3) $$\tau = \sqrt{\frac{c^2 R}{GM}}\, t \quad ; \quad \tau = \frac{c}{R}\sqrt{\frac{3}{4\pi G\rho}}\, t$$

As stated above, when $GM = c^2R$, the body is on the Schwarzschild Limit and $\tau = t$. Or possibly the Schwarzschild Limit is the result of a resonance condition resulting from $\tau = t$. If the Schwarzschild Limit is the fundamental, we question how or whether higher harmonics are manifested.

Another basic question is, how is density time properly interpreted? It is not age, it is not related to motion or travel time. It is cyclical, it manifests itself physically in satellite orbital times and dynamical rotational limits. Is it a synchronization signal? A temporal pulse that preserves coherence of the body or system? Is it possibly a universal zeitgeber?

Chronos and Kairos

There are two distinct aspects of time. A description of the first is given by Omar Khayyam in the Rubiayat:

The moving finger writes
and having writ moves on,
nor all your piety nor wit
can lure it back to cancel half a line.

A description of the second is given in the Bible, Ecclesiastes 3:1-8:

For everything there is a season,
a time to every purpose under the heaven:
A time to be born, and a time to die;
a time to plant and a time to pluck what is planted.

The Greeks had a word for each type of time. CHRONOS (ΧΡΟΝΟΣ), meaning a period, a space of time, a duration of time. This is linear time, the time measured by the clock, ever flowing forward, ticking away. Chronos stands for the quantity of time. And KAIROS (ΚΑΙΡΟΣ), meaning the right time for an action, the critical moment, the opportune season. This is cyclical time, the time that presents or denies opportunity. Kairos stands for the quality of time.

Chronos is the time of physics. The aspect of time that can be measured. It is like the metronome of the musician, or like the odometer in our car, telling us how far we have gone. Kairos is the time of being, it has never been measured. It is the rhythm, melody and harmony of the musician, or the country side through which we travel. That there is kairos, a proper time to do certain things, means that time is not an isolated or independent entity, but is related to the events that occur in it. The same is true of space. Space is not an isolated or independent container, but is related to the objects which occupy it.

While kairos was of great importance to ancient Hebrews and Greeks, its experience today is obscured by technology, urbanization, and particularly by our modern worldview. In the age of science we are imprisoned by the idea that only that which is measurable is of significance. Since the only measurable aspect of time is duration, in our worldview time has come to be regarded as having only quantity, and to assert that there is also quality to time, i.e. kairos, is regarded as unscientific.

KAIROS01

There are many dyads in the nature of time: Kairos and Chronos, cyclical and linear time, objective and subjective time, peri and dia time, historical and primordial time, ... Some of these are the same slice, but in general there seem to be two aspects to time. Whether these can be considered as dimensions as with space is open to question.

Then there is the matter of singular points, referred to by Clark Maxwell. These are special moments of time when causality and determinism is broken. THe moments for selecting the next archetype. Even in chaos theory there is the possibility of perturbed initial points leading to quite diverse attractors. When do these initial points occur? Certainly not every moment of time is the same.

cf Celtic Samhain

Heschel reports that the Hebrews converted cyclical time into linear time by projecting historical events onto their calendar. Thus the beginning of spring, a cyclical event, becomes Passover, an historical event. Harvest, a cyclical seasonal event, becomes Succoth, an historical event. etc. The Christians followed this same practice projecting certain historical events, the Nativity, the Presentation, the Annunciation, the Resurrection, etc onto calendric seasonal times, converting the cyclical into the historical. Thus the liturgical calendar, though cyclical, is made historical and hence linear. This results in the destruction of Kairos, replacing it with Chronos. It is paradoxical that the kairotic statement of Eclesiastes 3:1-8 is rendered ineffective by the transference of cyclical to historical time. This practice has resulted in Christmas being an historical event, not an ever recurring event. Resurrection is historic, an event that took place 2000 years ago, rather than an event that occurs every year. The living vitality of Kairos is lost.

CHRONOS AND KAIROS

In almost all religious traditions there is implicit the notion of the existence of two kinds of time. The Greeks denoted these two times by chronos and kairos. Chronos is clock time while kairos is the proper time for an action to take place. The Hebrews had the same notion as is expressed in Ecclesiastes 3:1-8. Their two times even led to two New Year days. One was the beginning of the year in spring, the first of Nisan, the other in the fall at Rosh ha Shanah, the birthday of the world. One time was cyclical and governed the days of the festivals, the other was an on going linear or historical time. The Mayans made the same division with one time governed by a short count, the kairos, governed by a different god each day, and the historical or linear long count, their chronos.

Even in science there are kairos and chronos. The time involved in an experiment rolling balls down an inclined plane is purely chronos. However, the time when to launch a space probe for a minimum energy orbit involves kairos.

In modern times (chronos) the phenomenon called by Rifkin the 'graying of the calendar' has been spreading. This is in essence the obliteration of kairos. In trying to do what we want when we want, we choose to live as much as possible by chronos alone. But we must remember that Chronos devours his offspring. Which is to say that in seeking to ignore kairos, we become enslaved to chronos.

The concept of a proper time for doing anything has implicit in it the existence of two or more times or frequencies. Only when one frequency bears a particular relation to the other (such as being an harmonic) may the time be said to be proper for a certain activity. Sometimes the two times, cyclical and historical, are combined in a sprial or a helix. However, a better way of thinking about the two times might be to consider historical time as the carrier frequency which is modulated by cyclical frequencies and only when the signal is maximum, say, will the time for an activity be proper.

Kairos ⇒ a restraint

RE2TIMES.P51 DISK:ADVENT November 19, 1991

THE TWO TIMES IN RELIGION

Two times, cyclic and historic, are referenced by biblical statements:

The kingdom of God is within you. ==> cyclic or primordial time

Give no thought for the morrow. ==> cyclic

lay not up treasures on earth ⇒ cyclic

The poor you have with you always ==> cyclic

Celebrating the Eucharist every sunday. ==> cyclic

The liturgical year, its feasts and fasts. ==> cyclic

Living for the moment hedonism ==> cyclic

. . . . . .

The idea of the Messiah ==> historic time

The second coming ==> historic

Progress ==> historic

History ==> historic

Evolution ==> historic

The Marxist, 'Pie in the sky when you die' ==> historic

The Transfiguration with of Moses and Elijah ==> historic

The Apocalypse and the Rapture ==> historic

The Last Judgement ==> historic

. . . . . .

The strait and narrow would seem to be a tight rope between the two extremes of live-for-the-moment hedonism and an apocalyptic rapture.

In what way may the two times be mediated?

The social gospel to care for the present poor ==> cyclic
to create a better world ==> historic

Spirals and helices

The incarnation and mapping of archetypes, as the example of the parallels between the old and new testaments, the fulfillment of prophecy.

~~in~~ archetypes which ⇒ cyclic

History repeats itself

Symbolically in the equation of time going to zero as Christmas arrives. God's time and chronos are reconciled four times a year as the equation goes to zero.

In the metaphor of the tree, the historicist is concerned with how large it will grow, what the timber yield will be. The primordialist is concerned with the perennial yield of fruits.

Two kinds of present
that before a future and after a past
and the primordial eternal present

But timber may be the fruit of some greater cycle
Lumber

TIME1.WP5 DISK: JOURNYEAR02 JANUARY 4, 1990

Some notes on Time, Cycles and Spirals

In our ageing and in the laboratory we experience time as linear--the moving finger writes, and having writ moves on. But in the seasons and in the manifestations of life itself we experience time as cyclical--plants sprout, grow, mature and die then are reborn, sprout, grow, mature and die. All things animal, vegetable, mineral--whether they are humans, trees, mountains or even stars--age and decay, yet all are reborn and move endlessly through the cycle of birth and death. The linear facet of time appears to derive from the pervasive presence of the Second Law of Thermodynamics while the cyclical facet seems to originate with the forces of plenitude and preservation.

One device which we have employed to represent phenomena subject to these two aspects of time is to map them onto a continuous curve, such as a spiral or helix which combines both line and circle. This is adequate so long as only continuous processes such as growth and decay are involved and nothing new is created. But spirals and helices cannot do justice to creation, emergence or to transitions between levels. Continuity is the essence of a reality and continuity restricts us to a single level or single reality. In order for two levels or realities to interact there must be some break in continuity. But in our experience of time do we not also experience moments of discontinuity? Those instants of time detached from the steady advance of the clock in which our consciousness is blanked or in which our consciousness is released and we partake of eternity.

of iteration
+ recursion

We have a physical example of discontinuous action between levels in the Bohr model of the atom. In this model electrons are represented as particles which planetwise orbit the atomic nucleus. But energy may leave or enter the system altering the orbiting configuration and this always occurs in a discontinuous manner. Upon interaction with energy to or from the outside, the electrons do not spiral, but jump from one orbit to another, moving discontinuously from one continuous configuration to a different continuous configuration. It is this type of activity that is precluded in spiral and helical representations of change. While a spiral may provide an appropriate model for growth ocurring through seasonal cycles or even a model for adaptive evolutionary change, it does not model transformation, emergence or extinction or events involving interaction with other levels. If left alone a system may move on a circle or spiral, but if something is incarnated from outside--such as an $h\nu$ packet of energy as in the case of the atom--a transformation results.

We may further appeal metaphorically to the atom. In order for an interaction to take place, the system and the incoming energy must be in tune. The frequency, ν, in the energy packet must match the frequency of the electron orbit or no transformation can take place. And so it is with all change beyond growth and decay. There must be a tuning between the seed, psyche, or soul, and the incarnating life essence, information, or divine spirit before transformation can take place.

On Critical Times

Some of you have perhaps visited Lake Powell, situated on the Colorado River in the center of some of the most magnificent scenery that North America has to offer. Stark cliffs of red sandstone and white limestone descend vertically to the waters edge with no intervening vegetation, a unique juxtaposition of rock and water rarely found elsewhere on earth. Throughout the entire lake region there is an overwhelming impression of other worldliness. One cannot enter this place without having the feeling that it is holy land, a sacred place. This feeling must have been experienced even by movie producers, who in looking for a site to film a picture dramatizing the life of Christ, were moved to select it to represent the original Holy Land.

Some years ago my sons and I went on an exploration trip around the lake. Today one is able to reach with relative ease by water areas that were all but inaccessible before the creation of the lake. One evening we camped on a sand bar off the south shore of the lake. While we were setting up camp and preparing our evening meal we happened to look across the lake and saw an amazing sight. There chiseled on the face of the red cliff staring directly at us across the water was the awesome face of some historic indian chief. The features were as distinct as those of the presidents carved on the face of Mt. Rushmore in South Dakota. A message seemed to be coming to us that the face and the earth were timeless while we were but brief visitors, perhaps even intruders. Transfixed we stood watching and after a few minutes as the sun sank lower shadows gradually erased the face. We could then see how the face had been created by the irregularities in the cliff and the particular angle of the sun's rays. But even though the features had disappeared the presence and message remained with us--I might add, with me, even to this day.

The next morning there was no face on the cliff, only irregular shadows and random markings. We were intrigued to know whether the face would return again in the evening when the shadows were just right, so we decided to return and camp again that night on the same sand bar. That evening as we watched at the same time before sunset the face began to reappear and to dominate the entire landscape with its presence. However, it seemed slightly different than on the evening before.

Several days later on our last night we decided to make our camp again on the sand bar. On this occasion the face was still recognizable but had become distorted. It then became clear to us that the face was a periodic not a permanent feature. If one were to come to the lake on just any day to see the face, he or she would be denied. It can only be seen on special days when the declination of the sun is proper and at special times when the altitude of the sun is proper and from a special place where the angle of viewing is proper. Such phenomena can only be perceived if we have placed ourselves in the right place and then only when the natural order chooses to manifest them, not when we choose to see them.

cf. Non-reproducible results

The idea that there is a proper time, a proper place, and a proper frame of mind for various activities has been largely discarded by our culture. Science is about the ubiquitously repeatable With such inventions as electric lighting reducing the distinctions between day and night, and with central heating and air conditioning reducing the distinctions between winter and summer we have developed the illusion that we have achieved mastery over time. We can do whatever we wish whenever we wish. Modern refrigeration and transportation allow us to have fresh fruits and vegetables at any time of year, New Zealand strawberries for Christmas, Mexican melons at any time. Day and night, summer and winter have been overcome. Human schedules have replaced nature's rhythms. Man's time has subdued God's time.

However, there are certain events like the appearance of the great face on the cliff wall that are not subject to human scheduling. When we seek to reach out beyond our mercantile, political and societal obsessions to touch and perceive what lies beyond, we find that we can do so only in synchrony with God's time. When it was decided to send space probes such as Mariner and Voyager to Venus, Mars and the outer planets, it was necessary to launch at special times within a narrow "launch window", else there would be insufficient energy for the mission. Tuning to the universal order is not new wisdom, it is forgotten wisdom.

Ecclesiastes 3:1-8 states,

To every thing there is a season,
and a time to every purpose under the heaven:
A time to be born, and a time to die;
A time to weep, and a time to laugh;
A time to mourn, and a time to dance;
A time to get, and a time to lose.

This scripture is not a reminder to be sure to allow time in your schedule for each of these activities, it is an admonition to set your activities into tune with God's time. It means that there is a proper time in accord with the wholeness of things for each activity, and that this proper time moves free of our clocks and schedules.

The Greeks recognized this basic distinction between the two kinds of time with two words: **chronos**, meaning duration, linear time; and **kairos**, meaning everything in its season, cyclical time. The mythic Chronos was said to devour his children. And in our age certainly chronos has been devouring kairos. Schedule has displaced proper time, secular time has replaced sacred time. Some writers have called this "the graying of the calendar."

One example of this is the erosion of the Sabbath. No longer is there one day of the week that is held sacred and kept different from the other days. While people may not work at the same job every day of the week, stores and businesses remain open full seven days and the general level and type of activity varies but little. The last day I can recall that was really different was the day of President Kennedy's funeral. The whole nation for one whole day took on a contemplative and thoughtful mood.

The Physicists Tim

DIMENSIONAL TIMES

On the basis of dimensional considerations there are four species of time:

t Motion or Radar time

$$t = \cancel{2\pi}\frac{R}{c}$$

$t = h\nu$

τ Density or Kepler time

$$\tau = \frac{\cancel{2\pi}R^{\frac{3}{2}}}{\sqrt{GM}} = \sqrt{\frac{3\pi}{G\rho}} = \sqrt{\frac{3}{4\pi G\rho}}$$

T Energy time

$$T = \frac{h}{Mc^2}$$

K Gravitational time

$$K = \frac{hR}{GM^2}$$

Complementary to each of these four times are four energies given by (action/time) in each case. (h has the dimensions of action)

Motion energy

$$E_m = \frac{hc}{\cancel{2\pi}R}$$

Density energy

$$E_\rho = \frac{h\sqrt{GM}}{\cancel{2\pi}R^{\frac{3}{2}}} = \sqrt{\frac{h^2G\rho}{3\pi}} = \sqrt{\frac{h^2G\rho}{3\pi}}$$ check

Total energy

$$E_t = Mc^2$$

Gravitational energy

$$E_g = \frac{GM^2}{R}$$

HISTCYCL.P51 January 29, 1993

All processes of change contain two components: a linear or historical component and a cyclical or archetypal component.
Journey Engine
Cycles have been conventionally represented in electrical theory by vectors. The length or magnitude of the vector representing amplitude, the direction or angle representing phase. One common way of representing a vector is in the exponential form:

$$V=e^{(\alpha t+i\omega t)}$$

In the complex number, $\alpha t+i\omega t$, the real part represents the linear or historical facet of the process while the imaginary part represents the the cyclical or archetypal facet of the process. The period or duration of the cycle is given by $t = 2\pi/\omega$. For the "historical" portion of the change to be actually linear, αt must be equal to $\ln(At)$, that is

$$V=Ate^{i\omega t}$$

This equation may be generalized by replacing the linear functions αt and ωt with the general functions $\alpha(t)$ and $\omega(t)$. Thus

$$V=e^{[\alpha(t)+i\omega(t)]}$$

represents the general equation of change.

The historical rate of change will be the real part of the derivative,

$$\dot{\alpha}(t)\,[e^{\alpha(t)}+\cos\omega(t)]-\dot{\omega}(t)\sin\omega(t)$$

The archetypal rate of change will be the imaginary part of the derivative,

$$\dot{\omega}(t)\,[e^{\alpha(t)}+\cos\omega(t)]+\dot{\alpha}(t)\sin\omega(t)$$

Ratio of the length of the $\frac{\text{Journey cycle}}{\text{Engine Cycle}}$ = Q_L

In our experience $Q_L >> 1$

but can we find cases of $Q_L < 1$?

Perhaps what we see as revolution is the case of $Q_L < 1$ Design

TOS

ZEITGEBR.WPW DISK:COSNUMBARS May 16, 1993

THE ZEITGEBERS

THE FERMIONIC CLOCKS

The general theory of relativity postulates the equivalence of space-time geometry and the dynamic or mechanical properties of matter. The equivalence of geometry and dynamics allows alternate descriptions of the world; the properties of space and time may be formulated in terms of the properties of energy and matter and vice versa. An example of this is the equivalence of mass densities and temporal periods. We have dimensionally,

$$[T^2] = \left[\frac{R^3}{GM}\right] \tag{1}$$

More specifically, if **T** represents the fundamental temporal period associated with a spherical object of radius **R** and mass **M**, then

$$T^2 = 4\pi^2 \frac{R^3}{GM} \tag{2}$$

where **G** is the Newtonian gravitational constant. Equation (2) is recognized as the Schuster period of a gravitating body, i.e. as the limiting case of Kepler's third law when the orbiting radius is equal to the object radius. Equation (2) may be rewritten in the form

$$T = \sqrt{\frac{3\pi}{G\varrho}} \tag{3}$$

where ϱ is the mass density. It follows that the frequency associated with a mass is proportional to the square root of the mass density.

Three specific examples of equation (2) give us the fundamental periods of three universal clocks. The first of these is the *atom clock* based on the proton mass m_p and the Bohr radius a_o.

$$\tau^2 = 4\pi^2 \frac{a_o^3}{Gm_p} \tag{4}$$

The second is the *baryon clock* based on the ~~electron~~ nuclear radius r_e and the proton mass m_p.

$$T^2 = 4\pi^2 \frac{r_e^3}{Gm_p} \tag{5}$$

More density clocks:

$\tau \doteq 120$ minutes
$Sh_{\oplus} \doteq 84$ minutes } ~~7 day week~~ $= 1440$ m

$Rot_{\oplus} = 24$ hr
$Sh_{\oplus} = 84$ m } → 7 day week

$\frac{Rot}{Sh}_{\oplus} = \frac{1440}{84} = \frac{120}{7}$

120 Sh in 7 days

$\frac{R}{\tau} = \frac{1440}{120} = 12 \Rightarrow$ 12 τ per day

$\frac{\tau}{Sh_{\oplus}} = \frac{120}{84} = \frac{10}{7} \Rightarrow \quad 7\tau = 10\, Sh_{\oplus}$

$Sh_{\odot} = ?$

Boson Clocks (Radar, Light travel Time)

mass = 0

Interaction of Fermion + Boson Clocks

diam $\oplus \doteq 12{,}800$ km

$c = 3 \times 10^5$ km/sec.

$\frac{12800}{3 \times 10^5} = 0.043$ sec $\times \pi = 0.135$ sec

i.e. The period light around earth c. 8 hz
cf. lepton Time

Check light in earth ~~to~~ orbit
~~If it~~ around sch time

The third is the *lepton clock* based on the electron radius r_e and the electron mass m_e.

$$t^2 = 4\pi^2 \frac{r_e^3}{Gm_e} \tag{6}$$

Using the values [1]

$a_o = 5.291772\text{x}10^{-9}$ cm, $m_p = 1.672623\text{x}10^{-24}$ gm
$r_e = 2.817941\text{x}10^{-13}$ cm, $m_e = 9.109390\text{x}10^{-28}$ gm

The following values for periods and frequencies are obtained:

CLOCK	PERIOD	FREQUENCY
ATOM	τ = 7239.94 sec	0.000138 hz
BARYON	T = 0.0028134 sec	355.44 hz*
LEPTON	t = 0.120537 sec	8.296 hz

* The frequency 355.44 hz lies between F (349.23) and F# (369.99) above middle C.

These values are approximately 2 hours and 40 seconds for the *atom clock*, 2.8 milliseconds for the *baryon clock*, and one eighth second for the *lepton clock*.

The ratios of the periods are given by:

$$\frac{T}{\tau} = \alpha^3, \quad \frac{t}{T} = \sqrt{\mu}, \quad \frac{t}{\tau} = \alpha^3\sqrt{\mu}$$

where α is the fine structure constant and μ is the ratio of the proton to the electron mass.
($\alpha = 7.297\ 353\ 08\text{x}10^{-3}$ and $\mu = 1.836\ 152\ 701\text{x}10^{3}$)[1]

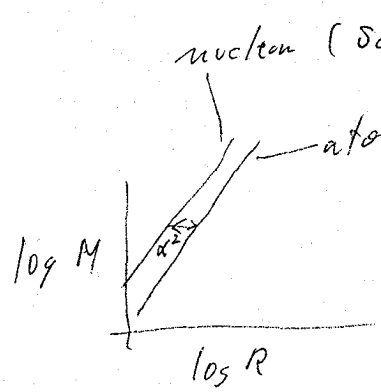
THE BOSONIC CLOCKS
Short lived Gluons, Mesons, ...

[1] Cohen, E.R. and B.N.Taylor The fundamental physical constants Physics Today, August 1992 p9ff

Beats and Synodics

$f_1 + f_2$

$f_1 - f_2$



How are the potential limits related to the zeitgebers?

B10 - CULTURAL TIME

91-#5 JOURNYOYEAR/TIME

See also #91,#101

1-10-91

CLOKTIME.P51 DISK: ~~AGWSCRAPS~~ T45

EXAMPLES OF THE THESIS THAT DISEASE, DYSFUNCTION, AGEING,... RESULT FROM CLOCK-TIME TENSIONS:

1) JET LAG: STANDARD TIME ORIGIN - STANDARD TIME DESTINATION

2) SAD: MEAN SOLAR TIME - APPARENT SOLAR TIME
[JOURNEY OF THE YEAR] SEASONAL AFFECTIVE DISORDER

3) PREMENSTRUAL SYNDROME:

4) "URBAN STRESS": SCHEDULES - NATURAL TIME

5) AGEING: EARTH TIME - ATOMIC TIME
[CHON]

THREE PHYSICAL PRINCIPLES:

I. Every system must have a slow or inertial/mass rate and a fast or electric/information rate. Coherence and coordination of material systems depend on the communication of information at the fast rate. This is the embodyment in the material world of the deeper principle of the necessity for "Primordial-Kairos-Chronos" (THE TEMPORAL TRINITY

II. Systems possess inate or natural rates and respond to external or imposed rates. The results are beat frequencies beteen the two rates. [Stress may be the result of the beat frequencies]

III. The general theory of relativity demonstrates that the existence of matter effects and affects the existence of space-time. Hence associated with every particle of matter is both a ruler and a clock. The ruler determines the scale and curvature of local space, the clock provides a local zeitgeber for coherence of any systems present and sets a temporal scale.

~~P~~ α or motion time (special relativity) (Aristotle)
ρ or density time ~ general relativity (Kepler-Newton)

It may not be the tension between inner and outer clocks that directly causes ageing, but that the tension (error signal) gives rise to beats, and the beats cause ageing.

PLANTAN1.WPW DISK:WORK02 June 21, 1993

THE TWO KINGDOMS OF LIFE

The sun had set. The evening was cooling and the twilight darkening. I walked out to where the little ginkgo tree stood. It amazed me that it had added over a foot and a half to its height this spring, almost doubling its size. I was proud of this tree, not just because I had planted it, but because its health made me feel healthier.

I wondered about trees, whether they had some special kind of consciousness that we were unaware of. In the myth, eating the fruit of a tree led to our own consciousness, maybe the trees were somehow storehouses and stewards of consciousness. Then I wondered about various states of consciousness. I asked the ginkgo tree, "Do you sleep at night?" No verbal answer, but quickly a mental answer: "We trees do not sleep in the night, we sleep in the winter." That is true, I thought, how obvious. But then it is most interesting that the plants march to the beat of the yearly drummer while we animals march to the beat of the daily drummer. Plants are tuned to the earth's revolution, animals to its rotation.

But there are other difference/similarities, such as the "proportion", magnesium : chlorophyll :: iron : hemoglobin. And I have often speculated about the tendency of plants to minimize and animals to maximize the volume to surface ratio. That is plants are treelike and animals are spherelike. But we also know that attraction forces, like gravity, generate spheres and repulsion forces like all plus charge coulomb forces generate tree forms. So we have:

PLANTS		ANIMALS
Minimize V/S	volume / surface	Maximize V/S
~ repulsion forces		~ attraction forces
tuned to 365 day cycle		tuned to 24 hour cycle

Magnesium #12 Wt 24.312 (3x8) Iron #26 Wt. 55.847 (7x8)

This table suggests that the nature of a force, attraction vs. repulsion, may in some way be associated with time, with the length of a cycle. Gravity, for example, may operate at certain frequencies and the force of expansion of the universe at others. Contraction and expansion as ~~functions~~ overtones of the frequencies of some cosmic clock.

		n×4	n	C-K	
	C	12	3	1d	Other Carbon life at n×4
	Mg	24	6	2d	
	Fe	56	14	14d	
earth	Si	28	7	7d	⇒ the week
air	N	14		7d	

Tuned to Seasons i.e. Sun

Tuned to the Moon

We customarily use the scala

inanimate
viruses
mono-celular
plants
animals
humans

If we make the scala on parameterization
with regard to what "software" the hardware has access to:

inanimate
cellular
plants animals
trees humans
⋮ ⋮

i.e ∃ a bifurcated scala with
the possibilities in the plant
kingdom as great as in the animal

We have yet to learn to communicate
between levels and branches

Is the source of time built into all organisms, or are we really being driven by the earth clock outside us?
--Avini, Empires of Time p29

{[If CHON is the zeitgeber, can we then detect physical changes at the atomic and molecular levels having CHON periodicities? Any changes would have to be detected in individual atoms or molecules, because in aggregates it is highly improbable that the phases of the cycles would be the same. The statistical aggregation of random phases would wash out detectability of the cycles. For periodicities to be manifested in aggregates the atoms and molecules would have to be coherent, i.e. their individual periods would have to be in phase. However, there do exist molecular aggregates which manifest periodicities. We call these aggregates living organisms. We are led to the surmise, consistent with what we know about biological clocks, that the zeitgeber lies within every atom of the organism. We may further speculate that **coherence** of atomic zeitgebers is a property of living systems. When the coherence diminishes, ageing takes place and when it reaches a certain level of randomness, death occurs.

In living systems the zeitgebers are in phase, they exhibit coherence. In inanimate systems the zeitgebers are random.
The fountain of youth is the resynchronization of the zeitgebers.]}

TIME & SPACE updated?

TIME5.WP5 DISK:JOURNYEAR02 FEBRUARY 10, 1990

The role of thought in sentient systems:

Numerous examples have been given in the literature of the effects of positive or negative thoughts on the functioning and the structure of sentient systems. The spectrum of the effects of thought on living matter range from hypochondria through placebos to Christian Science. It is thus proper to conclude that those findings of physics and chemistry which have been found applicable to all physical systems, in the case of sentient systems, must be supplemented with the affects on their functions and structure played by the actions of their thoughts. In those sciences which focus on being 'objective' these subjective affects have naturally been missed or ignored.

Model: All physical systems exist in three spatial dimensions. All physical systems also exist in the dimension of sequential time. Living systems, particularly those systems that experience subjective time, also exist in a second temporal dimension in which the 'velocity of the now' moves at variable speeds. Which is to say that if a system experiences a varying velocity of the 'now' or the present, then that system also exists within a second temporal dimension, which can in distinction be called subjective time. Hence inanimate systems are one dimensional in time, and living, or at least sentient, systems are two dimensional in time.

In the worldview of this model it becomes essential to consider sentient systems as not operating under the laws of ordinary 'objective' physics and chemistry, but under the laws of 'thought-modified' chemistry and physics. These laws are at present not formalized nor well understood. However, their differences from the laws of objective chemistry and physics are explicit in countless anecdotes and in the inferences of many experiments with bio-systems.

The linear time used in objective chemistry and physics ignores the interior of the cycles of which time is composed. It generally restricts itself merely to the counting of the number of cycles involved in phenomena. But if the interior details of the changes in temporal quality within a cycle play a role, as with circadian rhythms, for example, the bio-system must have access to these fluctuations of quality. This is achieved by altering the temporal resolving power, 'zooming' in or out, in effect slowing or speeding the rate of the flow of time with respect to the system. The total count of integral cycles, however, remains the same over a period of linear time as for objective systems.

Whether it is proper to call the power to expand and contract time a second dimension of time is not the question. What is significant is that the ability to expand and contract time infers the existence of a second temporal dimension, just as the ability to introduce curvature between two fixed points on a line infers the existence of more than one spatial dimension. While expansion and contraction of time can be considered analogous to and mappable onto curvature, we may further take the view that expansion/contraction forces displacement into higher temporal dimensions which themselves contain the quality of time.

3 - JOURNOYEAR / TIME

LANGTIME.P51 DISK:JOYTIME 1-11-91

LANGUAGE AND TIME

- SLAVIC LANGUAGES: PERFECTIVE AND IMPERFECTIVE ASPECTS
- INDO-EUROPEAN LANGUAGES: VERB TENSES
- HOPI: MANIFEST AND UNMANIFEST

. . . . . .

On Slavic Languages from The Software Toolworks Illustrated Encyclopedia (TM) (c) 1990 Grolier Electronic Publishing, Inc.

Slavic languages

In the 18th century, Slavic scholars realized that their languages possessed a grammatical category not shared to any appreciable extent by other Indo-European languages: verbal aspect. Every verb is classified today as belonging either to the perfective aspect or to imperfective aspect. A perfective verb focuses attention on a certain phase or aspect of the verbal action--the onset of action, for example, or its completion, or the action taken as a whole. An imperfective verb simply describes the verbal action with no particular [temporal] focal point.

Of the six Indo-European tenses--present, future, imperfect, aorist, perfect, and pluperfect--Common Slavic preserved the present and the aorist. The old imperfect and perfect were replaced by a new imperfect, and the Indo-European future was replaced by the present tense form of the perfective verb. The new perfective form singles out some aspect of the verbal action that did not take place prior to the moment of speech and that is therefore intended by the speaker to take place afterward, usually sometime in the future. A periphrastic future found in the East and West Slavic languages expresses a future action without focal point. In the South Slavic languages, the future can only be formed through the help of Slavic languages expresses a future action without focal point. In the South Slavic languages, the future can only be formed through the help of an auxiliary verb or particle.

Old Church Slavonic possessed an elaborate set of verb forms--up to 236 for an imperfective verb. All but Eastern Serbo-Croatian, Macedonian, and Bulgarian have lost the aorist and imperfect tenses. In these languages the old perfect has come to signify a past action not witnessed by the speaker; the perfect form is used in the other Slavic languages to signify a nonpresent tense, most commonly the past, but it is also used in conjunction with an auxiliary form to denote the conditional (as in Russian or Czech) or even the future (as in Slovenian).

. . . . . .

The term aorist is from the Greek aoristos meaning unlimited or indefinite. The aorist tense signifies action took place in unspecified past time with no implication of continuity, repetition or completion.

CHRONOLOGY

PAMP5.WS4 DISK JOURNYEAR01 11/14/86 11/17/86
calndrs.p51

A NOTE ON CALENDARS

Calendars are yardsticks for the measure of time. Their basic structure derives from the cyclical astronomical configurations of the earth, sun and moon which determine the length of the day, month and year. Calendars are needed to calculate numbers of lapsed days and to inform us of the season. There are two basic problems in constructing calendars: 1) The problem of 'co-mensuration' arising because the day, the month, and the year are not even multiples of one another and the fractions of days and months must be taken care of. 2) The problem of keeping calendric dates coordinated with the vernal equinox, i.e. making the calendar conform to the year of the seasons as closely as possible.

Calendars as used for counting the number of lapsed days provide a temporal base for the commercial functions of society--On what day will the rent be due? How long before the shipment arrives? How much interest has accrued? Calendars use for synchronizing with the seasons provide a temporal base for the agricultural and religious functions of society--When should the corn be planted? When can we expect frost? When will Easter be this year? With these two needs we suspect we might need two calendars: Civil calendars and Ecclesiastical calendars. This is true, although Western society being highly secularized has with few exceptions adapted to a single calendar. Christians still need supplementary calendric data for calculating the dates of "moveable feasts" such as Easter, and those groups still using lunar calendars, such as Jews and Muslims, require their own ecclesiastical calendars. Civil calendars consider time as linear and ignore any quality attributes of time. Liturgical calendars, on the other hand, consider time as cyclical and inform us what activities should be emphasized at what times. Harvest is the time for thanksgiving, Lent is the time for purification, Carnival is the time for suspending the rules.

Although our cultural schizophrenia requires these two calendars, both are structured on the same basic astronomical data derived from the rotation and revolution of the earth. To design a calendar we need to specify a beginning point of the year and measure how long it takes for the sun to complete a circuit back to this beginning point. Although our civil calendars have selected the Roman January 1 as New Year's day, the real reference point for the year of seasons is the vernal equinox, and the length of the year of the seasons, called the tropical year, has been determined as being 365.24219 days. But the design of an ecclesiastical calendar is more complex. We must know additional parameters of the earth's orbit, the inclination and the eccentricity, so that we may determine in more detail the timing of the seasons. The Greek astronomer Hipparchus who lived in the second century B.C. first calculated the lengths of the seasons. He found spring to be 92 days and 20.2 hours, summer 93 days 14,4 hours, autumn 89 days 18.7 hours, and winter 89 days 0.5 hours.

The co-menurability problem centers on how to take care of the fractions of days that are left over after the year has been filled with whole days. Over centuries these fractions can lead to large discrepancies between the dates of the calendar and the seasons of the year. If calendars were needed solely for measuring intervals of time, then having periods with winter beginning in April and summer in October would be disconcerting but not disasterous. But if the seasons are important in our activities then we must establish a dependable correlation between the calendric dates and the physical and psychological quality of time. To do this the average length of the calendric year must equal as closely as possible the length of the tropical year.

An important step in this design was undertaken by Julius Caesar in 46 b.c. With the help of the astronomer Sosigenes, he designed a calendar in which the average calendric year was equal to 365.25 days (cf tropical year of 365.24219 days). The ingenious device was the concept of 'leap year', an extra day every fourth year. But even with this better approximation after 1500 years the year of the seasons had drifted 12 days with respect to the Julian calender. This change in the date of the coming of winter or spring was becoming widely noticable. The time had come for another refinement. In 1582 Pope Gregory XIII with the help of the astronomer Clavius, established a new calendar, now known as the Gregorian calendar. The rules governing leap years were augmented. Every even century year was not to be a leap year unless divisible by 400. These rules gave the average Gregorian year a length of 365.2425 days. This is a much better approximation, being in error only about one day in three thousand years.

HINDU

A Kalpa = 1 day & night of Brahma
= 1000 ~~yugas~~ Maha Yugas
= 4,320,000,000 solar years.
(4.32 billion years ≈ age of earth)
Univ now about 2 to 3 Kalpas old
8.64 BY to 12.96 BY

The 4 Yugas

Krita Yuga (Golden Times)	1,728,000	years
Treta Yuga	1,296,000	years
Dvapara Yuga	864,000	years
Kali Yuga (present times)	432,000	years
Total	4,320,000	years = a Maha Yuga or Manvantara

× 1000 = a Kalpa

The Kali Yuga began 3102 B.C.E.

Beginning Marks:

Julian Day	4713 B.C.E.	
Bishop Ussher	4004 B.C.	
Hebrew	3760 B.C.E.	
Mayan	3372 B.C.E.	also Aug 12 3113 B.C.E. *
Present Kali Yuga	3102 B.C.E.	
1st Olympiad	776 B.C.E.	
Founding of Rome	753 B.C.E.	
Christian	1 C.E.	
Islamic	622 C.E.	
Age of Horus	3141 B.C.E. *	

* Lemesurier - "The Great Pyramid Decoded" p 265

distant. If we were to travel in the Newtonian mode, even at maximum velocity, some 7500 years would be involved If we adopt the fractal mode we would zoom out to the galaxy scale level in which our map would cover the entire milky way system; move horizontally (Newtonially) across the galaxy to near Eta Carinae, zoom partially in, correct horizontally, zoom in again, correct horizontally, etc, until we reach the desired location in the neighborhood of Eta Carinae.

In all of this, first, we do not know how to zoom, to move vertically, nor do we know what vertical velocities are possible. Second, we do not know what a scale change would do to Einstein's bound on horizontal velocities. Third, if fractal mode movement is not possible for physical bodies, is it possible for the movement of information?

III. The Local/Non-local Mode:

If macro bodies, like micro bodies, can alter between two states (local ~ particle and non-local ~ wave), then another hypothetical mode of movement is suggested. In this mode an object in the local state of being here and now, first diffuses (transforms) into its non-local state becoming everywhere and everywhen. Second, it selects where and when it wants to "un-diffuse" and finally transforms back to its localized state at its selected new position in space and time. This mode allows for time travel as well as space travel.

THE CALENDAR AND ITS HISTORY:

Julian Year:
365.25 msd's
Gregorian Year:
365.2425 msd's
Mayan Year:
365.2420 msd's
Tropical Year:
365.2422 msd's

Sidereal Year
365.256365 msd's

The rules governing the Gregorian Calendar are:
Every year the number of which is divisible by 4 is a Leap Year. Century years are not leap years unless divisible by 400. To convert O.S. to N.S. Add 11 days for the 18th century (Mar 1 1700 to Feb 28 1800)
Add 12 days for the 19th cent;
Add 13 days for the 20th cent.
The Gregorian Calendar is off 1 day in 3000 years.

Julian Days:
by J. Scaliger in 1852. The zero day is the day at Greenwich at mean noon on January 1, 4713 B.C.
January 0d 12h ET 1900 is JED 241 5020.0

THE CALENDAR AND ITS HISTORY:

In the year 46 B.C., on the advice of the Alexandrian astronomer Sosigenes, Julius Caesar introduced a new calendar. The ingenious feature of his "Julian Calendar" was the concept of a leap year, a year in every four in which an additional day was added. The best of the older calendars used a year of 365 days, but these calendars were in such error that in about seven centuries seasonal January would occur in July. Since the exact length of year lies between 365 and 366 days, the problem in calendar design is how to take care of the fractional part in excess of 365 days. The Julian calendar's method of one leap year in four rendered an average year of 365.25 days, but even this better approximation resulted in an error of 8 days in 1000 years.

By the 16th century the error in the Julian calendar had become seasonally noticeable. In response, in March of 1582 Pope Gregory XIII, with the assistance of the astronomer Clavius, established a "New Style Calendar", now known as the "Gregorian Calendar". October 4th, 1582 was followed by October 15th, (11 days added) in all Catholic Countries and January 1, was restored as New Year's Day. In Gregory's calendar the Julian rule of making every year whose number is divisible by four a leap year of 366 days was augmented by the rule that even century years are not to be leap years unless divisible by 400. This resulted in a calendar year of 365.2425 days, in error one day in 3000 years.

In England and the British Colonies, the day after Wednesday, September 2, 1752 was Thursday, September 14, 1752. Prior to this there were two New Years Days celebrated in England--Lady's Day (March 25th) and January 1. The same act of Parliament that adopted the Gregorian Calendar established January 1, as New Years Day, e.g. George Washington was born Feb 11, O.S., or Feb 22, N.S. 1732.

CALENDAR.MEM AGW VECTOR GRAPHIC 08/18/82
Calendar.p51 10/04/90 T+S

THE RECORDING OF TIME BY USING CYCLES

Selection of units (cycles)

Day: Rotation of earth
Month: Synodic period of moon
Year: Revolution fo the earth
Sub-units: Hours, minutes, seconds.

Selection of starting points

Dawn, Noon, Sunset, Midnight
New Moon, Full Moon
New Years Day
Vernal equinox
January 1,
Rosh Hoshana Sept.

Selection of epochs

Christian era: There was no year "0".
Hegira: 622 A.D. = Year 1 of the Muslim Calendar.
Hebrew: 3760 B.C. = Year 1 of the Jewish Calendar.
Greek: The first Olympiad (recorded) 776 B.C.
Roman: From the founding of Rome, 753 B.C.
Mayan: First date referred to, 3372 B.C.
Geologic: Ages of unequal length since the formation of the earth.
Big Bang: Time elapsed since the beginning of expansion.

Hindu Present Kali Yuga began 3102 B.C.E.

add Bishop Ussher 4004 BC

1° Julian Day 4713 B.C.

THE COUNTING OF CYCLES

THE PROBLEMS OF CO-MENSURATION

The basic problem of the calendar is that of comensuration, the matching of cycles. How best to measure the length of one cycle in terms of a second cycle when the two are not comensurate. The matching of the month to the day, the year to the day and the year to the month are the three principle problems.

Cycles or waves are characterized by the following parameters:

The period or duration of the cycle.
This must be expressed in some units of time, either a sub-unit based on another cycle or on counts of sub-units of the cycle itself.
The phase.
This relates the beginning of the cycle to some other cycle, like the date of new year's day.
The amplitude.
Generally ignored or considered meaningless in calendric considerations.
The timbre.
The effect of superposing various cycles.

THE LENGTH OF COMMON CYCLES:

Rotation of the earth with respect to fixed stars:
24h 00m 0.0s in sidereal units
23h 56m 4.09892s in solar units
Rotation of the earth with respect to the vernal equinox:
xx in sidereal units
xx in solar units
The Mean Solar Day:
24h 03m 56.555s in sidereal units
24h 00m 00.0s in solar units

Synodical Month: (new moon to new moon)
29.530 588 msd's
Sidereal Month: (ref. fixed stars)
27.321 661 msd's
Tropical Month: (equinox to equinox)
27.321 582 msd's
Anomalistic Month: (perigee to perigee)
27.554 551 msd's
Nodical or Draconitic Month: (node to node)
27.212 220 msd's

Transit Interval of the Moon:
24h 50.47m ms units.
Mean daily motion of the Moon:
13 deg 11' east
Period of rotation of the moon's perigee (direct):
8.85 years
Period moon's node (retrograde):
18.61 tropical years.
Inclination of the Moon's Orbit to the Ecliptic:
5 deg 8', but oscillates from 4 deg 59'
to 5 deg 18' with a period of 173 days.

Sidereal year: (ref fixed stars)
365.256 365 msd's
Tropical year: (equinox to equinox)
365.242 199 msd's
Anomalistic year: (perihelion to perihelion)
365.259 641 msd's

The Obliquity of the Ecliptic:
23 deg 27' 8.26"

Period of precession of the earth's node (retrograde)
50.398"/year
25,725 years (fixed ecliptic)
25,784 years (moving ecliptic, effects of planets)

The period of oscillation of the inclination of the earth's axis = 40,032 years

The period of the variation of the eccentricity of the earth's orbit = 93,408 anomolistic years

DAYS OF THE WEEK

ENGLISH	SAXON	GERMAN	LATIN	FRENCH	SPANISH
SUNDAY	SUN'S DAY	SONNTAG	DIES SOLIS	DIMANCHE	DOMINGO
MONDAY	MOON'S DAY	MONTAG	DIES LUNAE	LUNDI	LUNES
TUESDAY	TIW'S DAY	DIENSTAG	DIES MARTIS	MARDI	MARTES
WEDNESDAY	WODEN'S DAY	MITWOCH	DIES MERCURII	MERCREDI	MIERCOLES
THURSDAY	THOR'S DAY	DONNERSTAG	DIES JOVIS	JEUDI	JUEVES
FRIDAY	FRIGG'S DAY	FREITAG	DIES VENERIS	VENDREDI	VIERNES
SATURDAY	SETERNE'S DAY	SAMSTAG	DIES SATURNI	SAMEDI	SABADO

RUSSIAN	GREEK	SWEDISH	ITALIAN	JAPANESE	JAPANESE
ВОСКРЕСЕНЬЕ	ΚΥΡΙΑΚΗ	SÖNDAG	DOMINICA	NICHIYOUBI	日
ПОНЕДЕЛЬНИК	ΔΕΥΤΕΡΑ	MÄNDAG	LUNEDI	GETSUYOUBI	月
ВТОРНИК	ΤΡΙΤΗ	TISDAG	MARTEDI	KAYOUBI	火
СРЕДА	ΤΕΤΑΡΤΗ	ONSDAG	MERCOLEDI	SUIYOUBI	水
ЧЕТВЕРГ	ΠΕΜΠΤΗ	TORSDAG	GIOVEDI	MOKUYOUBI	木
ПЯТНИЦА	ΠΑΡΑΣΚΕΥΗ	FREDAG	VENERDI	KINYOUBI	金
СУББОТА	ΣΑΒΒΑΤΟΜ	LÖRDAG	SABATO	DOYOUBI	土

POLISH	HEBREW
NIEDZIELA	REESHOHN
PONIEDZIALEK	SHAYNEE
WTOREK	SHLEESHEE
SRODA	REMVEEEE
CZWARTEK	KHAHMEESHEE
PIATEK	SHEESHEE
SOBOTA	SHAH BAHT

DAYWEEK2.WSQ

TIMWEEK1.P51 DISK:TIME August 7, 1991

A PHYSICAL BASIS FOR THE WEEK

Our basic units of time, the day, the month, and the year, have their obvious origins in the rotation of the earth, the revolution of the moon, and the revolution of the earth. Our smaller units of time, the hour, minute, and second are derived from numerically convenient but rather arbitrary divisions of the day. The origin of the week as a unit of time, however, has always been a bit of a puzzle. It has been suggested that it originated as being a quarter of a month, but the month of lunar phases is not 28 days, but about 29.5 days, which over time renders the week a rather poor unit for keeping track of the phases of the moon.

The week, however, has a non-astronomical origin in the traditions of the Jewish people. God created the world in six days and rested on the seventh. God then ordained the Sabbath and thus established the week as a unit of sacred time. In more modern times this tradition seemed to be arbitrary to some would be reformers. Experiments with weeks of different lengths were attempted during the French revolution and later during the Russian revolution. Weeks of as long as 10 days and as short as 4 days were tried, but the results were negative. There appears to be a basic cycle of seven days that conforms with the human disposition. The seven day week of ancient tradition, even though without astronomical origin, seems not to be arbitrary.

also Market Cycles

for longer & shorter weeks

With such negative experimental results, the question arises whether there might indeed be some physical basis for a seven day cycle after all. Since no heavenly body is known that can provide the basis for this period, perhaps we should look to the earth itself for its origins. What periodicities are associated with the earth besides its rotation and revolution periods? Are there other basic terrestrial periods? One such basic period acquired prominence when artificial satellites were first put into orbit. This is the so-called 'Schuster Period' -- the period of a zero-altitude satellite. It is the time required for a satellite to orbit the earth at the earth's surface, which is determined by the size and mass of the earth.

The Schuster period is a limiting period. It is the theoretical shortest possible time for any satellite operating solely under the influence of natural forces to orbit the earth. Its value is a few seconds over 84 minutes. But because of the earth's atmosphere, no practical satellite could have that short a period. Practical satellites must operate above the bulk of the atmosphere and the greater the altitude the longer the orbital period. The length of orbital period increases from 84 minutes at the earth's surface to 24 hours at the 'synchronous distance' of about 22,000 miles, where most communications satellites are located, to roughly 30 days at the distance of the moon.

The Shuster Period is also the rotational limiting period, before equatorial fragmentation of Roche Limit

03/02/93

Another property of the Schuster Period:

It is the limiting rotational period for the earth. If the earth were to rotate faster than ~~a day of length~~ one rotation in 84 minutes, it would begin to disintegrate. The centrifugal force at the equator would exceed the earth's gravitational pull and mountains would begin to fly off into space.

We have a considerable "spin safety factor" on earth:

One rotation period = $24 \times 60 = 1440$ minute

The limiting rotation period for stability (the Schuster period) = 84 min

$$\frac{1440}{84} = \frac{120}{7} = 17.1 \text{ (safety factor)}$$

Note that implicit in this safety factor is 7 days = 120 schuster periods

The ratio of $\frac{\#\text{ schuster periods}}{\#\text{ rotation periods}}$ in a week = the earth's safety factor

---

rot of ⊕ ↑ perhaps at one time was exactly $\frac{120}{7}$

The earth's spin safety factor ~~is given~~ is expressed in terms of the ratio of schuster periods to rotation periods. The first value for which the n^{th} rotation ~~periods and~~ is an integer is 7 ⇒ days in a week!

Also noteworthy is a possible role of the baryon period, one of the basic zeitgebers of the universe. $\doteq 2^{hr}$

If P_s were 84 m exactly = 5040 sec
then 120 P_s = 7 days 88-2

$P_s = \sqrt{\frac{\pi^2 R_\oplus^3}{G M_\oplus}}$

Another interesting property of the Schuster period is that if there were a hole passing through the center of the earth and there were no atmosphere to create drag, a weight dropped in the hole would take exactly half a Schuster period to emerge with zero velocity at the antipode. In the absence of any frictional drag, the weight would oscillate back and forth from antipode to antipode in 84 minutes. In fact the hole would not even have to pass through the center of the earth. With no friction a hole tunneled along any chord through the earth would support the same period of oscillation—84 minutes. It is thus seen that this value of 84 minutes is intimately associated with the earth. It is indeed, along with the day and year, a basic terrestrial period.

∃ also 5068.775 sec

The precise value of the earth's Schuster period is 5042.519 seconds or 84m 2.5s which is the same as 1hr 24m 2.5s. Now comes another interesting property of the Schuster period. There are exactly 120 Schuster periods in one week. The error being less than one part in 2000. This tells us that the earth's Schuster period and the earth's solar rotation period are integrally connected and are in phase at one instant every seven days. Thus the week does have a basis in nature. It is the minimum time required for the rotation period and the Schuster period to return to the same phase.

Get new values for $M_\oplus$ $R_\oplus$

When I worked for an aerospace company we had an allotted lunch hour of 42 minutes. I presumed that management was displaying their knowledge of orbital mechanics to impress us we lived in the space age, but curiously 42 minutes seemed to be just the right amount of time for an on site lunch. I have also noticed that in several areas the post office allows 21 minutes parking. Where does the post office get this figure? The time for a weight to fall to the center of the earth doesn't seem connected to the speed of postal service, but it has worked out fairly well (except during the Christmas season). However, the interesting questions are how such an invisible period came to be incorporated into the ancient tradition of a non-technical people; and what is there about the size and mass of the earth that humans seem to sense without instruments and theories?

also 21 min Meditation

But there is also a caveat. There are many calendar reform plans in the wings to simplify the fitting together of months, quarters, and the year. Most of these interject 'free days' two or more times a year, days that would not belong to any of the seven days of the week. Such reforms would destroy the millennia old record of the phase relation between the rotation and gravitation of the earth as mapped onto the days of the week. The week must remain inviolate in accord with how it was established and preserved for thousands of years in the Jewish tradition and later passed on as a heritage for all mankind.

Using the simplest numbers, we approximate

Day = 1
G-Period = $\frac{7}{120}$ day
Month = 28 days
Year = 364 days

G-Period = 13 days

$13 \cdot 7 = 91 \times 4 = 364$

4, 7, 13, 4·7 = 28

D G M Y
1, 13, 28, 364
4.7 →
91·4 W
S M S Y
1, 4, 7, 13, 28, 364
D O W G M Y

02/17/94

If x = the number of seconds in excess of 84 minutes, the exactness of phase return is lost by $120 \cdot x$ seconds per week. This is analogous to the " of arc of precessional motion of the Υ per year, leading to the Great Year of about 25,000 years.

What is the length of the "Great Week"?

In 1 week excess = $120x$ sec

But ∄ 604800 seconds in a week

∴ the number of weeks for the weekly excess to $\overset{\text{total}}{=}$ 1 week is $\frac{604800}{120x} = \frac{5040}{x}$ weeks

If $x = 2.5$ sec, this is 2016 weeks or ± 38¾ years

The Sabbath advances 1 day in about 5½ years

Larger values of $x \Rightarrow$ faster advance of the Sabbath

A more recent value for x is 19.6095 sec based on $\rho_{\oplus} = 5.517$ g/cm³

Best values between 233 weeks and 283 weeks → 257 weeks or 4.94 years for the Great Week

4.48 years 5.45 yrs

What is Jubilee? 49 or 50 years Lev 25:8.

The CN week from CHON will also "precess"

The Hebrews approximated to 1 week

The Mayans more precisely found a 1 day advance every 260 days

$\tau = \sqrt{\frac{3\pi}{G\rho}}$

$\bar{\rho}_{\oplus} = 5.517 \pm .004$ g/cm³ Allen p. 108

The Great Week is about 5 years

The sabbath advances 1 day in 37 weeks

or 1 day every 260 days

$\frac{257}{7} = 36.7$ weeks

cf. Mayan 260 days

⇨ G#week of 1820 days

or 4.983 years

The Mayan 260 day period is related to the delay advance of the 84 min phase-zero

TIMWEEK2.W52 DISK:TIME January 31, 1994

MORE ABOUT THE WEEK

In TIMWEEK1.P51, (1991-#88), several properties of the Schuster period were mentioned. To those reported there should be added the very important property of equatorial fragmentation. The Schuster period is the limiting rotational period for a rotating earth not to disintegrate. For the earth to rotate with a period shorter than 84 minutes, centrifugal force at the equator would exceed the gravitational pull, and the planet would become unstable with mountains flying off into space. But the good news is that we have a considerable "spin safety factor" against that occurring. One rotation period is 1440 minutes, the Schuster period is 84 minutes, giving a safety factor of

$$\frac{1440}{84} = \frac{120}{7} = 17\,1/7$$

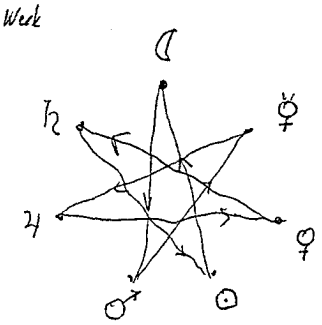
This ratio of 120/7 is also the ratio of Schuster periods to days in a week. Hence the earth's spin safety factor is implicit in the seven day week.

We have seen that the week is the smallest number of earth rotation periods with an integral number of Schuster periods. But also of interest are the "beat periods" between the Schuster cycle and the rotation cycle. Beat frequencies, f_b, are given by

$$f_s \pm f_r = f_b$$

where f_s and f_r are the Schuster and rotational frequencies respectively. Substituting 5/7 hours and 1/24 hours, we get beat periods of $1^h\ 29^m\ 12^s$ and $1^h\ 19^m\ 22^s$. These values are very close to 3/2 hour and 4/3 hour, which divide the 24 hour day into 16 and 18 intervals respectively. It seems that again the ancients were in touch with something we have lost. The division of daylight time into 9 "hours" was an ancient practice. (Still reflected in the Prime, Terce, Sext, None of the monastic day) Did this division of time into nine instead of twelve periods come from subtle or overt experience of the Schuster beat periods?

LATIN	DIA = Order in the Week
Solis	Sunday
Lunae	Monday
Martis	Martedi
Mercurii	Mercredi
Jovis	Jeudi
Veneris	Vendredi
Saturni	Saturni



THE WEEK AS CELEBRATION OF THE 7 PLANETS

Peri = Order in Sky (sidereal Period)

☽ = 30d

☿ = 88d

☿

☉

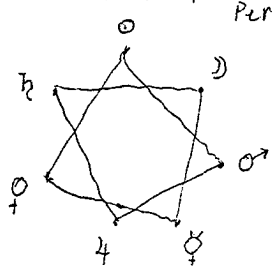
♂

♃

♄

(☉ ⟷ ⊕)

DIA SKY ORDER



The Dual

Peri: Week Orda

The week connects the earth's rotation period of 24 hours with its intrinsic period of 84 minutes.
120 Intrinsics = 7 rotations

Monastic Day
- Matins
- Lauds
- Prime or First Hour
- Terce or Third Hour
- Sext or Sixth Hour
- None or Ninth hour ← 9 periods goes with 18 breaks of $1^h 20^m$ duration
- Vespers
- Compline

Centrifugal Force Gravitation Pull

$$m\frac{v^2}{R} \leq \frac{GMm}{R^2}$$ Equilibrium

If $v^2 > \frac{GM}{R}$ unstable

but $v = \frac{2\pi R}{\tau_s} = \sqrt{\frac{GM}{R}}$

$\therefore$ if $\tau < \tau_s$, $v > \sqrt{\frac{GM}{R}}$

Sun 0
M $17\frac{1}{7}$
T $34\frac{2}{7}$
W $51\frac{3}{7}$
O $68\frac{4}{7}$
F $85\frac{5}{7}$
S $102\frac{6}{7}$
Sun 120

If we launch a surface satellite with a period of 84m at, say here, 12:00 noon, Sunday then at Noon tomorrow, the satellite will have completed $17\frac{1}{7}$ orbits. And at noon on the day after tomorrow, $34\frac{2}{7}$ orbits ... Finally on Saturday, noon $102\frac{6}{7}$ orbits and on Sunday noon 120 orbits

§ = 84 minute unit

So the next time the satellite will be here at its launch time will be in 7 days

The day = $17\frac{1}{7}$ §
The week = 120 §
The Year $\doteq$ 6262 §

What is the Schuster Period of the Moon?

The week also derives from Orion in particular CN and C Si

MOREWEEK.WPD APRIL 10, 2000

see also 1991 #88; 1994 #7, #13, #15

STILL MORE ABOUT THE WEEK

It has been noted that in looking for a natural cycle related to the week, that it is the earth itself, not the moon or some other planet, that provides the cycle. Indeed, it is the relation between the day and the earth's Schuster period that gives us a cyclical basis for the week. The Schuster period is related to the mass and size of the earth and is the time period in which a satellite would circle the earth at its surface were there no atmosphere or other obstructions. It is the limiting value of time that Kepler's third law would assume for a minimum orbital radius. In this case the minimum orbital radius being the mean radius of the earth itself. The Schuster time T is given by,

$$T = 2\pi\sqrt{\frac{R^3}{GM}}$$

where R is the earth's mean radius, G is Newton's constant, and M is the mass of the earth.

		Value in seconds	$\log_{10}$ value in seconds
T	The earth's Schuster Period	5042.51897	3.7026475
S	The earth's sidereal day	86164.09054	4.9353264
D	The mean solar day	86400.	4.9365137

First note the ratios:

$\frac{\log T}{\log S} = 0.7502326$ $\frac{\log T}{\log D} = 0.7500531$

Indicating that to within about 5 parts in 10^5 the ratio of the logarithms of the Schuster period to the day is 3 to 4. An example that many of the astronomical period or frequency ratios are between log values, unlike ratios of frequencies in music.

Next note the following values:

The first solution to the diaphantine equation M x T = N x D gives M = 120 and N = 7.

D/T = 17.134294, 120/7 = 17.142857, with $\delta = 0.009$ or 9 parts in 10^3

Seven days is equal to 604,800 seconds, 120 Schuster periods is equal to 605,102.27 seconds, the difference being 302 seconds or just over five minutes.

302/604,800 = 0.0004993 or 5 parts in 10^4

It is accordingly suggested, without a mythic explanation regarding the origin of the week, that somehow humans tuned in on this basic relation between these two fundamental natural cycles.

SYNCHRONIZATION OF THE EARTH'S ROTATIONAL AND GRAVITATIONAL PERIODS

Four basic periods are associated with the earth: The revolution period of one year, the lunation period of one month, the rotation period of one day, and the gravitational (or Schuster) period of 84 minutes plus a few seconds. Since these various periods have no simple integral multiples, there is the problem of commensuration, or finding the simplest ratios of their values. For example, since ancient times solutions to the problem of when the full moon will occur on the same calendric date have been sought. One answer was the Metonic Cycle of 235 lunations = 19 years. (235 synodical months = 6939.6882 days, while 19 years = 6939.6018 days, the difference being 2h 4m 24s) In the western hemisphere, the Mayans found that 81 moons = 2392 days before the moon appeared in the sky at the same phase at the same time.

The same problem arises in determining the synchronization of the mean solar day with the earth's G-period. To a first approximation the G-period of the earth is 84 minutes. This value synchronizes exactly with the 24 hour rotation period of the earth every seven days. That is 120 x 84 minutes = 7 x 24 x 60 minutes = 10080 minutes. Is it possible that this first approximation to G-period solar day synchronization could be the basis of the week? The question arising here is in what manner did ancient humans sense the G-period.

But the value of the G-period is not exactly 84 minutes. Using the present most probable value for the earth's density of 5.517 ± 0.004 gm/cm^3, the G-period is about 84 minutes and 19.61 ± 1.83 seconds. This means that there is not precise synchronization every seven days, but there is an error of approximately 120 x 20 = 2400 seconds (40 minutes) each week. This value is approximately half a G-period, so we would expect a better approximation to be a fortnight. Actually a minimum synchronization error of 33.4 seconds occurs in 13 days. But this error is accumulative so an exact synchronization, if any, will occur only at some much longer period.

To find synchronization periods it is necessary to solve the Diophantine equation

$$N_1 \times CYCLE_1 = N_2 \times CYCLE_2$$

where N_1 and N_2 are integers. For the choice of cycles, G-period and day, we get the following table:

DENSITY	PERIOD	No. G-PERIODS	DAYS	ERROR
5.517	84m+19.609s	222	13	+33.3s
5.513	84m+21.445s	973	57	-14.3s
5.521	84m+17.776s	205	12	+44.1s
5.51733	84m+19.3495	222	13	+0.009s

The density value of 5.51733, differing very slightly from the most probable value, gives an almost exact synchronization of the day and G-period every 13 days. With this value the maximum error in the 13 day cycle occurs on the seventh day. So, the new twist would be that synchronization does not occur on the seventh day as it would if the G-period were exactly 84 minutes, but that the times get most out of synch on the seventh day. God in creating the world realized that the synch error was increasing every day, and at the end of the sixth day He felt things were getting out of hand, so decided to take the next day off. Things began to improve on the eighth day, but we aren't sure what God did in the second week. *Probably, thought if things are improving, don't fix them.*

A Gnostic view would be

KPLRTIME.~~PR5~~ PST DISK:JOURNYEAR02 T+S February 23, 1990

Old Time2

SOME THOUGHTS REGARDING KEPLER'S LAWS

I have long felt that Kepler's laws contained far more clues to the structure of the natural order than the important relations that Newton constructed out of them. In accord with Gerard's dictum for remodularization, it may be appropriate to look at Kepler's laws from some different perspectives:

extracted for

In the second law we have,
That in a single orbit, area swept is proportional to time or
R^2 is proportional to T
In the third law we have,
That in comparing orbits volume is proportional to time squared or
R^3 is proportional to T^2

Setting aside, for the moment, how Newton restructured Kepler's laws to produce the universal law of gravitational attraction, let us say that putting the second and third law in juxtaposition as above seems to point to a dimensional paradox. Perhaps we are talking about different kinds of time but all symbolized by T. Or maybe we are talking about different kinds of space but subsumed under the symbol R. Or both. Or as Newton would have it, the law governing the motion of one object is not talking about the same thing as the law comparing the motions of several objects.

Introduce Murchie's aphorism here

In studying the rotation of galaxies, we find that inner portions seem to rotate like solid bodies while outer portions rotate in accord with Kepler's third law. But solid body rotation is what is to be expected if the second law applies in comparing orbits, for points on wheels sweep out equal areas in equal times. The second law seems to govern single and closely connected bodies, while the third law seems to apply to less connected bodies. Recalling a classical and medieval view, we might say that the second law governs motions of bodies on the same level while the third law governs motions of bodies on different levels. Bodies on the same level are using the same clock while bodies on different levels are using different clocks. We are accustomed to describing all motions in terms of our own clock, but this is the source of the paradox, for each 'level' has its own drummer.

emit w etic

but united or synchronized by or in meta-time

We are not talking about the relation between the clocks of observers in relative motion as described by Einstein's special theory. In that theory there is one dimension of time which is modified by the Lorenz transformations when there is relative motion. Here we are trying to sniff out the possible existence of a completely different time dimension--an orthogonal time.

3/13/91 old TIMEKPLR

I like to specultate on some of the ignored paradoxes contained in Kepler's Laws. The Second Law tells us that the movement of one body about another under the influence of an inverse square attraction law, follows a relation of

$$\text{time} \propto \text{area}$$

or dimensionally $$\Delta t = a\ r^2$$

The Third Law tells us that in comparing distinct bodies moving under the same law of attraction, that

$$(\text{periods})^2 \propto (\text{mean distance})^3$$

or $$P^2 = b\ R^3$$

Now if we equate P with t and R with r, we have a dimensional inconsistency.

Newton looked at the constant of proportionality, b, and found it contained the mass. What is the nature of the constant a?

97/11/29

The possibilities:

1) There is one kind of time

$r^2 \propto T$

$R^3 \propto T^2$ $\Rightarrow$ $\exists$ 2 kinds of space (r and R)

$r^4 = k R^3$

$r^3 \propto R^{9/4}$

2) There is one kind of space

$R^2 \propto t$

$R^3 \propto T^2$ $\Rightarrow$ $\exists$ 2 kinds of time (t and T)

$t^{1/2} = T^{2/3}$

$t = T^{4/3}$

3) There is but one kind of time and one kind of space

$R^2 \propto T$

$R^3 \propto T^2$ $\Rightarrow$ a contradiction

4) There are two kinds of time and two kinds of space.

$r^2 \propto t$

$R^3 \propto T^2$

r = extension

R = separation

t = duration

T = interval

But M enters into the 2° equation $GMT^2 = R^3$

Does this force us into a curved space?

$$G\frac{M}{R} = v^2$$

$v = \frac{1}{h}$ 2° law $v = \frac{ds}{dt} = r\frac{d\theta}{dt}$

On earth $- sv = \frac{r}{t}$

If the clock used for the cosmic expansion is T

and $T = 8 \times 10^9$ years $\log = 9.903$

then $t = 1.6 \times 10^{13}$ years $\log = 13.204$

TIME2.WP5 DISK:JOURNYEAR02 (TIME) February 23, 1990

SOME THOUGHTS REGARDING KEPLER'S LAWS

I have long felt that Kepler's laws contained far more clues to the structure of the natural order than the important relations that Newton constructed out of them. In accord with Gerard's dictum for remodularization, it may be appropriate to look at Kepler's laws from some different perspectives:

From a dimensional point of view

In the second law we have,

That in a single orbit area swept is proportional to time or

R^2 is proportional to T

In the third law we have,

That in comparing orbits volume is proportional to time squared or

R^3 is proportional to T^2

Setting aside, for the moment, how Newton restructured Kepler's laws to produce the universal law of gravitational attraction, let us say that putting the second and third law in juxtaposition as above seems to point to a dimensional paradox. Perhaps we are talking about different kinds of time but all symbolized by T. Or maybe we are talking about different kinds of space but subsumed under the symbol R. Or both. Or as Newton would have it, the law governing the motion of one object is not talking about the same thing as the law comparing the motions of several objects.

In studying the rotation of galaxies, we find that inner portions seem to rotate like solid bodies while outer portions rotate in accord with Kepler's third law. But solid body rotation is what is to be expected if the second law applies in comparing orbits, for points on wheels sweep out equal areas in equal times. The second law seems to govern single and closely connected bodies, while the third law seems to apply to less connected bodies. Recalling a classical and medieval view, we might say that the second law governs motions of bodies on the same level while the third law governs motions of bodies on different levels. Bodies on the same level are using the same clock while bodies on different levels are using different clocks. We are accustomed to describing all motions in terms of our own clock, but this is the source of the paradox, for each 'level' has its own drummer.

We are not talking about the relation between the clocks of observers in relative motion as described by Einstein's special theory. In that theory there is one dimension of time which is modified by the Lorenz transformations when there is relative motion. Here we are trying to sniff out the possible existence of a completely different time dimension--an orthogonal time.

This is the problem of a chain suspended from a geocentric 24 hr orbiting body.

What will the chain do?

solid body $v \propto r$

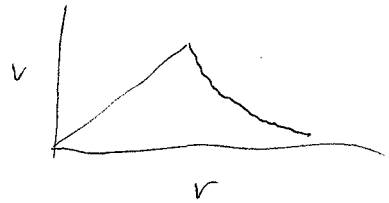
or

Keplerian $v \propto r^{-1/2}$

$\omega(r) = \text{const}$ $\rho(r) = \text{const}$

$\omega(r) \propto r^{-3/2}$ $\rho \propto \frac{1}{r^3}$

$M = \text{const}$



what is $\rho(r)$?

TIMKEPLR.P51 DISK: TIME March 13, 1991

I like to specultate on some of the ignored paradoxes contained in Kepler's Laws. The Second Law tells us that the movement of one body about another under the influence of an inverse square attraction law, follows a relation of

$$\text{time} \propto \text{area}$$

or dimensionally $\Delta t = a\ r^2$

The Third Law tells us that in comparing distinct bodies moving under the same law of attraction, that

$$(\text{periods})^2 \propto (\text{mean distance})^3$$

or $P^2 = b\ R^3$

density involved

Now if we equate P with t and R with r, we have a dimensional inconsistency.

Newton looked at the constant of proportionality, b, and found it contained the mass. What is the nature of the constant a?

Solid body motion $\Delta t = a r^2$

Keplerian motion $p^2 \propto R^3$

In what way does t differ from p and r from R

r = distance, R = separation ? extension

If ∃ some universal so that we compare all wheels or solid bodies as having the same period

No ⇒ spatial difference

& everything being of same size ⇒ temporal difference.

∃ some r and t relation beyond the Minkowski's

CHON

$$\tau_0^2 = \frac{4\pi^2 a_0^3}{G m_0} = \frac{4\pi^2}{G}\frac{1}{\frac{m_0}{a_0^3}}$$

$$= \frac{3\pi \frac{4}{3}\pi a_0^3}{G m_0} = \frac{3\pi V_0}{G m_0} = \frac{3\pi}{G\rho_0}$$

The weak part of CHON →

Note that the assumption
$\tau_1 \propto W_1 \tau_0$
is equivalent to
$a_1 = W_1 a_0$
as well as
$M_1 = W_1 M_0$

$$\tau_1^2 = \frac{3\pi V_1}{G m_1} = \frac{3\pi V_1}{G W_1 m_0}. \quad \text{if } V_1 \doteq V_0 \text{ then } \tau_1^2 = \frac{3\pi}{G W_1 \frac{m_0}{V_0}} = \frac{\tau_0^2}{W_1}$$

We have taken $\tau_1 = W_1 \tau_0$ — This assumption is G

The above gives $\tau_1 = \frac{\tau_0}{\sqrt{W_1}}$

Quantum Space doesn't behave like mass space

$\tau_0 = 2^{hr}$

e.g Carbon $\quad \frac{2^{hr}}{\sqrt{12}} = 0.577^{hr}$

Oxygen $\quad \frac{2^h}{\sqrt{16}} = 30\,min$ because of S, $S^{-1/2}$ etc

To make the assumption work, cannot assume $V_1 \doteq V_0$

1) $\tau_1 = W_1 \tau_0 \Rightarrow \frac{2\pi a_1^{3/2}}{\sqrt{G W_1 M_0}} = \frac{W_1 2\pi a_0^{3/2}}{\sqrt{G M_0}}$

or $\frac{a_1^{3/2}}{\sqrt{W_1}} = W_1 a_0^{3/2}$

or $a_1^{3/2} = (W_1 a_0)^{3/2}$

or $a_1 = W_1 a_0$ and $M_1 = W_1 M_0$

Period $= \frac{B}{\sqrt{\text{Density}}}$

time = K Area $\quad \sqrt{T} = \sqrt{K}\, R$

$\sqrt{R} = \left(\frac{T}{K}\right)^{1/4}$

$\rho = \frac{M}{A \cdot R} = \frac{MK}{T \cdot R}$

$\rho_1 \propto \frac{M_1}{a_1^3} = \frac{W_1 M_0}{W_1^3 a_0^3} = \frac{\rho_0}{W_1^2}$

$P = \frac{B\sqrt{TR}}{\sqrt{KM}} = \cancel{B\sqrt{T}}$

$\tau_1 \propto \frac{1}{\sqrt{\rho_1}} \propto W_1 \tau_0$

$$\rho = \frac{B\, T^{1/2}\, T^{1/4}}{K^{3/4}\, M^{1/2}} = \frac{B\, T^{3/4}}{K^{3/4}\sqrt{M}}$$

TIMKEPLR.P51 DISK: TIME March 13, 1991

I like to specultate on some of the ignored paradoxes contained in Kepler's Laws. The Second Law tells us that the movement of one body about another under the influence of an inverse square attraction law, follows a relation of

time $\propto$ area

or dimensionally $\Delta t = a\, r^2$ $t_i - t_j \propto A_{ij}$ INTRA-CYCLE TIME (has quality)

The Third Law tells us that in comparing distinct bodies moving under the same law of attraction, that

(periods)^2 $\propto$ (mean distance)^3

or $P^2 = b\, R^3$ COUNT CYCLES no quality

Now if we equate P with t and R with r, we have a dimensional inconsistency.

Newton looked at the constant of proportionality, b, and found it contained the mass. What is the nature of the constant a?

ONE POSSIBILITY MASS has something to do with time. (as the GTR claims)

t and P are different in what ways?
1) t is a part of a cycle, P is a whole cycle

$P = \sqrt{b}\, R^{3/2}$

$R = \sqrt{\frac{t}{a}} = \left(\frac{t}{a}\right)^{1/2}$

$R^{3/2} = \left(\frac{t}{a}\right)^{3/4}$

$\boxed{P = \frac{\sqrt{b}}{a^{3/4}}\, t^{3/4}}$

$\boxed{P = \frac{J}{\sqrt{M}}\, t^{3/4}}$

$\frac{1}{\sqrt{M}} \sim t^{1/4}$

$M \sim \frac{1}{t^{1/2}}$

"M must supply a $\frac{1}{\sqrt{E}}$ element" to P

2° Law

$t_2 - t_1 \propto A_2 - A_1$

$\frac{dA}{dt} = \text{const}$

$A \propto t = k^{-1} t$

$P = \int_{t=0}^{P} dt = \int_{A=0}^{A} k\, dA = kA$

but $P^2 \propto A^3$ ...

The 3° Law $\Rightarrow$ $P \propto \frac{1}{\sqrt{\rho}}$ ρ = space density, P has to do with mass does t?

P and t are different times!

FOR CHONS $\tau \propto \frac{1}{\sqrt{\rho}} = \frac{B}{\sqrt{\rho}}$

we have assumed $\tau_i \propto At\,W_i \cdot \tau_0 = \frac{M_i}{M_0}\,\tau_0$ $\frac{\tau_1}{\tau_2} = \sqrt{\frac{\rho_2}{\rho_1}}$ $\rho_2 = \frac{M_2}{r_2^3}$ $\rho_1 = \frac{M_1}{r_1^3}$

Something cancels $r_2 = r_1$ $\therefore$ $\frac{\rho_2}{\rho_1}$ $\frac{M_2}{M_1}$

$\tau_2 = \tau_1 \sqrt{\frac{M_1}{M_2}}$

2^0 Law $\Rightarrow$ $t \propto R^2$ (ignoring mass)

3^0 Law $\Rightarrow$ $P \propto R^{3/2}$

$t = kR^2$

$P = gR^{3/2}$

If we assume R's are the same dimensionally then t and P, both of which we associate with time aren't the same.

$t = kR^2$ $\qquad \frac{1}{\sqrt{R}} = \left(\frac{k}{t}\right)^{1/4}$

$dt = k\,dA = k\,2R\,dR$

$\int dt = 2k \int R\,dR$

$P = gR^{3/2}$

$dP = g\frac{3}{2}R^{1/2}\,dR$

$[k] = \left[\frac{T}{L^2}\right]$

$g = \frac{2\pi}{\sqrt{GM}}$

$dP = \frac{3}{2} g \sqrt{2k}\,\frac{2kR\,dR}{R^{1/2}} = \frac{3g}{4k}\frac{dt}{\sqrt{R}} = \frac{3g}{4k} k^{1/4}\frac{dt}{t^{1/4}}$

$P^{3/4} \sim \frac{R^{3/2}}{\sqrt{M}}$

$\frac{R^3}{M} \sim P^{3/2}$

$P \sim \frac{R^2}{M^{3/2}}$

$P = \frac{3g}{4k^{3/4}}\,t^{3/4} = \frac{g}{k^{3/4}}\,t^{3/4} = gR^{3/2}$

$t^{3/4} = g\,k^{3/4}R^{3/2}$

$t = kR^2$

$$\boxed{P = \left(\frac{g}{k^{3/4}}\right)t^{3/4}}$$

---

introduce M

$g = \frac{2\pi}{\sqrt{GM}}$ $\qquad P = \frac{2\pi}{k^{3/4}\sqrt{G}}\,\frac{t^{3/4}}{M^{1/2}} = \frac{Q\,t^{3/4}}{M^{1/2}}$ $\qquad Q = \frac{2\pi}{k^{3/4}\sqrt{G}}$

for 1 kind of R

$$\boxed{P = \frac{2\pi}{k^{3/4}\sqrt{G}}\,\frac{t^{3/4}}{\sqrt{M}}}$$

$P^2 M = Q^2 t^{3/2}$

if $M \sim P^{-1/2}$ $\qquad M \propto \frac{1}{\sqrt{P}}$

$$\boxed{\frac{P^{7/4}}{t^{3/4}} = \frac{2\pi}{\sqrt{GM}}R^{3/2}}$$

or maybe two kinds of R or both: two kinds of R and two kinds of T

$[G] = \left[\frac{L^3}{MT^2}\right]$ $\qquad [k] = \left[\frac{T}{L^2}\right]$

$T^2 = \frac{4\pi^2 R^3}{GM}$

$G = \frac{4\pi^2 R^3}{MT^2}$

$P = \frac{2\pi}{T^{3/4}}\frac{L^{3/2}}{L^{3/2}}M^{1/2}T\,\frac{t^{3/4}}{M^{1/2}}$ OK dimensionally

$P = \frac{2\pi}{\sqrt{GM}}\left(\frac{t}{k}\right)^{3/4}$

k is a function of what? size of orbit

The problem is in the k, how does it change with orbit size? $k = \frac{4\pi^2}{GM}R^2$

TIME7.P51 DISK:JOURNYOYEAR 1973

Taken from the Introduction to the book, Tools of Astrology Houses.

The hands of the clock display but a small part of what our consciousness experiences as the phenomenon of time. Not only can human consciousness expand a minute of clock time to what seems hours or contract an hour to what seems only minutes but our subjective experience impresses upon us the reality that time possesses much more than mere duration. Time is also rich in quality. All of us continually experience the moods of time: The cycle of the day with its changing hours of expectancy, vibrancy, stillness and gloom; the cycle of of the year with its seasons of awakening, activity, fruition and sleep; even the cycle of lunation with its more subtle phases of expansiveness, heaviness, closedness and emptyness. These cycles, through all of the nuances created by their superposition, lead us to feelings that the time may be propitious or out of sorts, focused on diffused. These basic cycles together with other still more subtle cycles provide us with the fact that, in quality two instants of time are never exactly alike, and that the common physical conception of time as linear and uniform, possessing only sequence and duration, is far too naive a viewpoint for an adequate description of the richness of the human experience of time.

The quality of time impressed itself on human awareness long before there existed adequate psychological techniques for independently measuring the states of the psyche that reflect the quality of time. Ancient peoples overcame these lacks through their adaptation of the movements and patterns in the sky for the measure of rhythms and the symbolization of psychologicl esssences. The markings in the sky were more permanent and more accurate than any available written language. They were an indelible and universal display whose observation permitted the ready retrieval of the phases of the multitudionous cycles basic to the cosmos and to life.

New f/r
Astrbook.wpd Nov 17, 2004

Add:
Sound of Music 1959
Surrey with Fringe on Top 1943
Your Cheatin Heart
You Ought to Be in Pictures
FASCINATION
~~TICO TICO~~
SEND IN THE CLOWNS
Voy a Con Dios
AM I BLUE
~~FIVE + TEN CENT STORE 1931~~
QUARTER TO NINE
IF I LOVED YOU
JEALOUSY
LOVELY TO LOOK AT
MAYBE
SUNNY
SANTA LUCIA
GIRL I LEFT BEHIND

JOURNEY OF THE YEAR: ORGANIZATION

The Journey of the Year is divided into seven sections:

PROLOGUE
1. THE BOOK OF TIME
2. THE BOOK OF SEASONS
3. THE BOOK OF CELEBRATIONS, FESTIVALS, AND REMEMBRANCES
4. THE BOOK OF SYMBOLS AND REPRESENTATIONS
5. THE BOOK OF RITUALS AND SACRAMENTS
6. THE BOOK OF TEMENOS
7. THE BOOK OF TRANSFORMATION

EPILOGUE

PROLOGUE:

Life, Earth, and the Cosmos are partners pulsing in unison to create an organic whole through rhythmic bonds. The Journey of the Year is a meditation structured around the cycles and rhythms–physical, psychological, and spiritual–which we share with each other and with the earth. Its purpose is to help us establish harmony between our inner unique and outer shared rhythms; and to guide our spiritual transformation utilizing the qualities of time.

1. **THE BOOK OF TIME:**
   - TIME AND THE EARTH
     - THE PRINCIPAL CYCLES
       - DAY, WEEK, MONTH, YEAR
     - THE SUBDIVISIONS:
       - THE HOURS, THE SEASONS
     - THE LONGER CYCLES
       - PRECESSION, INCLINATION, ECCENTRICITY
     - THE ANALEMMA
       - THE NORTH-SOUTH AND EAST-WEST MOTIONS OF THE SUN
   - THE MEASUREMENT OF TIME
     - CALENDARS:
       - CIVIL AND LITURGICAL
       - SOLAR AND LUNAR
       - VARIOUS CULTURES
         - EGYPTIAN, HEBREW, GREEK, ROMAN
         - HINDU, MAYAN, CELTIC, MODERN
     - CLOCKS:
       - DIVISIONS OF THE DAY: MONASTIC, NAUTICAL, CIVIL

MACRO CLOCKS:
RADIOACTIVE DECAY
CARBON DATING
TREE RINGS
MICRO CLOCKS:
ATOMIC CLOCKS
BIO-RHYTHMS:
CIRCADIAN AND OTHER RHYTHMS
JET LAG, SEASONAL AFFECTIVE DISORDER
CHON, THE UBIQUITOUS ZEITGEBER
SUBJECTIVE TIME:
THE RATE OF TIME FLOW
THE PERCEIVED PRESENT: THE WIDTH OF "NOW"
THE PAST AND MEMORY
THE FUTURE AND PRECOGNITION
SACRED TIME:
SECULAR TIME AND LITURGICAL TIME
THE QUALITY OF TIME, KAIROS
CHANGE AND CHANGELESS, BRAHMAN
PARAMETERIZATION OF TIME:
CYCLICAL TIME AND LINEAR TIME
CONTINUOUS TIME AND DISCRETE TIME, ARCHETYPES
BARYON TIME AND LEPTON TIME
THE DIRECTION OF TIME
CAUSALISM AND FINALISM
DETERMINISM, PROBABILISM, TELEOLOGY

2. THE BOOK OF SEASONS:
THE OUTER--NORTH SOUTH SEASONS
THE ROLE OF LIGHT AND DARKNESS
THE WEBER-FECHNER LAW
THE INNER--EAST WEST SEASONS
THE ROLE OF DILATION AND CONTRACTION
JET LAG AND SAD
THE ROLE OF THE MOON:
MOODS
SINGULAR DAYS
THE SOLSTICES AND EQUINOXES
THE DIVINE RATIO AND THE ANALEMMA
CELTIC QUARTER POINTS

TIME

THEORIES OF TIME
- CHANGE
- LINEAR AND CYCLICAL TIME
  - Chronos and Kairos
- DIRECTION OF TIME
  - Second Law of Thermodynamics
  - Causalism and Finalism Consequences as Causes
- DETERMINISM SPECTRUM
  - Determinism, Fibonaccian, Markovian, Existentialism
  - Hopi views
- PHYSICAL TIME
  - Matrices
  - Space-time
- SUBJECTIVE TIME
  - Dental Seconds
  - Civil Time, Client Time, Prussian Time
  - Jet lag

MEASUREMENT OF TIME
- LINEAR TIME
  - Cosmic Ages
    - Hubble Time
    - Geologic Time
    - Evolution
  - Cultural Ages
    - Astrological Ages (Pisces, Aquarius, etc)
    - Axial Periods
    - Mayan Suns
    - Astronomical Julian Days
- CYCLICAL TIME
  - Astronomical Cycles
    - Precession, Elongation, Apsides
    - Year, Month, Day, Analemma
  - Clocks
  - Calendars
    - Western, Liturgical Years
    - Celtic
    - Chinese
    - Hindu
    - Mayan
  - Keplerian Cycles
    - The Week, CHON

CHRONOS1.WPD August 18, 2011

CHRONOS

WHAT IS TIME?

IN WHAT WAYS IS TIME CONNECTED TO CHANGE? TO SPACE? TO ENERGY?

IS TIME LINEAR? CYCLICAL? MULTIDIMENSIONAL? UNIDIRECTIONAL?

HOW IS TIME MEASURED?

WHY ARE HUMANS RELATED TO TIME THROUGH: PAST, PRESENT, FUTURE?

USING THE PLANCK CONSTANTS, c, G, h HOW MANY COMBINATIONS CREATE THE DIMENSIONALITY OF TIME?

4times1.W52 DISK:TIME February 16, 1994

DIMENSIONAL TIMES

On the basis of dimensional considerations there are four species of time: Motion + Gravitational

t Motion or Radar time

$$t = 2\pi\frac{R}{c} \qquad t = f(R) \qquad t = \frac{h}{E}$$

τ Density or Kepler time

Time and Energy are complementary ? ∃ {his}?

$$\tau = \frac{2\pi R^{\frac{3}{2}}}{\sqrt{GM}} = \sqrt{\frac{3\pi}{G\rho}} \qquad \tau = f(\rho)$$

T Energy time

$$T = \frac{h}{Mc^2} \qquad T = f(M)$$

calculate each for ℓ

~~K~~ 𝒥 Gravitational time

also $\frac{GM}{c^3} = \Phi$

$$\mathcal{J} = \frac{hR}{GM^2} \qquad \mathcal{J} = f\left(\frac{R}{M^2}\right) = f(R,M)$$

Complementary to each of these four times are four energies given by (action/time) in each case. (h has the dimensions $[ML^2/T]$ of action)

Motion energy

Is there an RM time?

$$E_m = \frac{hc}{2\pi R} \qquad \sim \hbar\omega$$

Density energy

$$E_\rho = \frac{h\sqrt{GM}}{2\pi R^{\frac{3}{2}}} = \sqrt{\frac{h^2 G\rho}{3\pi}}$$

Normalizing with ℓ energy

Total energy

$$E_t = Mc^2$$

Gravitational energy

$$E_g = \frac{GM^2}{R}$$

Additional times $\tau_e = \frac{\hbar^3}{m_e e^4} = [T]$

An electric time

Electrical times?

$$\Upsilon = \sqrt{\frac{MR^3}{e^2}}$$

$$\Upsilon = \sqrt{\frac{hc}{e^2}}\,T = \frac{T}{\sqrt{\alpha}}\,; \qquad \Upsilon = \sqrt{\frac{M^2 G\tau^2}{e^2}} = \frac{M}{e}\sqrt{G}\,\tau$$

$\times 4\pi^2$?

$$\Upsilon = \frac{M}{\sqrt{\rho}}e$$

TEMPDYAD.W52 DISK:TIME February 17, 1994

TEMPORAL DICHOTOMIES

PHYSICAL TIMES

MOTION	DENSITY
ARISTOTELEAN	KEPLERIAN 2nd $T \propto R^2$ 3rd $T^2 \propto R^3$
LIGHT TIME	GRAVITATIONAL TIME
FAST	SLOW
INFORMATION	MATTER/ENERGY
COMMUNICATION	TRANSPORTATION
SPECTRAL LINES	G-ATOMIC
LEPTON TIME	BARYON TIME

BIOLOGICAL TIMES

NEURON TIMES	MUSCULAR TIMES
CIRCADIAN RHYTHMS	MONTHLY RHYTHMS
SUBJECTIVE TIME	OBJECTIVE TIME

CULTURAL TIMES

CHRONOS	KAIROS
SECULAR	LITURGICAL
SOLAR	LUNAR
IMPERFECTIVE	PERFECTIVE

CONCEPTUAL TIMES

LINEAR	CYCLICAL
EVOLUTIONARY INOVATIVE S_p^2	REPETITIVE ITERATIVE
HISTORICAL	ARCHETYPAL
TEMPORAL	PRIMORDEAL
FREQUENCY	PERIOD
CONTINUOUS	DISCRETE
OPEN	CLOSED
SEQUENTIAL	ETERNITY
PITCH	METER

Creativity must have two frames of reference.--Craik

Information must have a faster rate than matter.

Is Kairos associated with density time? Both are cyclical.
Is Chronos associated with motion time? Both are linear.

6times1.WP6 October 23, 1997

SIX TYPES OF TIME

On the basis of purely dimensional considerations six species of time may be derived:

t Motion or Radar time

$$t = \frac{R}{c}$$

τ Density or Keplerian time

$$\tau = \sqrt{\frac{R^3}{GM}} = \frac{1}{\sqrt{G\rho}}$$

T Total Energy time

$$T = \frac{\hbar}{Mc^2}$$

Z Gravitational Energy time

$$Z = \frac{\hbar R}{GM^2}$$

ζ Gravitational time

$$\zeta = \frac{GM}{c^3}$$

ϵ Electric time

$$\epsilon = \sqrt{\frac{MR^3}{e^2}}$$

Note that in the case of t, T, and ζ only one parameter, either M or R is involved. In the case of τ, Z, and ϵ both M and R are involved. [Are there two more times? Symmetry would say there should be one involving 1/R, and one involving RM^2, bringing the total to eight.]

KEPTIME.WP6 DISK: July 7, 1994

More on the Kepler Time Paradox

In the case of one dimension, there is the law of conservation of momentum:

$$mv=k, \qquad t/r \propto m, \qquad t \propto rm \tag{1}$$

In the case of two dimensions, there is the law of conservation of angular momentum:

$$mvr=k, \qquad t/r^2 \propto m, \qquad t \propto r^2 m \tag{2}$$

This result is seen to be the same as Kepler's Second Law, the law of areas.

However in three dimensions, an inversion occurs. Kepler's Third Law tells us that:

$$mt^2/r^3 = k \qquad r^3/t^2 \propto m \qquad t \propto r^{3/2} m^{-1} \tag{3}$$

A table compares the results of equations 1), 2), and 3):

DIMENSION	EXPONENT OF r	EXPONENT OF m
n = 1	1	1
n = 2	2/1	1
n = 3	3/2	-1
n = 4	4/3 ?	?
n = n	n/(n-1) ?	?

Multiplying 1) x 2) ✗ 3) gives $m^3 = k$, while 1) x 2) ÷ 3) gives $t^4/r^6 \propto m \rightarrow t \propto r^{3/2} m^{1/4}$

(conservation of mass

We seem to have two kinds of time: Momentum time and Density time.
Kepler's Third Law introduces two dimensional time.

2times4.w52 disk:TIME February 15, 1994

Motion Time and Density Time

Given a velocity and a distance, a travel time is derived by

travel time = distance/velocity

If a universal rate is postulated, such as the velocity of light, c, then a general concept of time is derived as

light time = distance/c

These travel or motion times support a "linear" concept of time. [Some motion times: light travel from sun = 499.012 seconds; light travel time of the earth's orbit = 3135.383sec = 52 minutes]

check: $\omega t = 2\pi$

A second concept of time derives from the dimensional analysis of a function of density

time = k/ √density

This kind of time supports a "cyclical" concept of time. For the earth, for example, density time is approximately 84 minutes, while motion time, $2\pi R/c$ is 0.137 seconds (~ frequency of 7.3 hertz).

These two times become numerically equal for bodies on the Schwarzschild Limit.

$GM/c^2R = 1$

For bodies with $GM/c^2R < 1$, which includes everything but black holes, density time exceeds motion time.

The formulae relating motion and density time derived from physical theory are as follows:
From the definition of density time

(1) $$\tau = \sqrt{\frac{4\pi^2 R^3}{GM}}$$

And the definition of motion time

(2) $$t = \frac{2\pi R}{c}$$

We derive

(3) $$\tau = \sqrt{\frac{c^2 R}{GM}}\, t \quad ; \quad \tau = \frac{c}{R}\sqrt{\frac{3}{4\pi G\rho}}\, t$$

As stated above, when $GM = c^2R$, the body is on the Schwarzschild Limit and $\tau = t$. Or possibly the Schwarzschild Limit is the result of a resonance condition resulting from $\tau = t$. If the Schwarzschild Limit is the fundamental, we question how or whether higher harmonics are manifested.

Another basic question is, how is density time properly interpreted? It is not age, it is not related to motion or travel time. It is cyclical, it manifests itself physically in satellite orbital times and dynamical rotational limits. Is it a synchronization signal? A temporal pulse that preserves coherence of the body or system? Is it possibly a universal zeitgeber?

Is it the minimum time for global "synchronization"?

CLOKTIME.P51 DISK: AGWSCRAPS

EXAMPLES OF THE THESIS THAT DISEASE, DYSFUNCTION, AGEING,... RESULT FROM CLOCK-TIME TENSIONS:

1) JET LAG: STANDARD TIME ORIGIN - STANDARD TIME DESTINATION

2) SAD: MEAN SOLAR TIME - APPARENT SOLAR TIME
[JOURNEY OF THE YEAR]

3) PREMENSTRUAL SYNDROME:

4) "URBAN STRESS": SCHEDULES - NATURAL TIME

5) AGEING: EARTH TIME - ATOMIC TIME
[CHON]

THREE PHYSICAL PRINCIPLES:

I. Every system must have a slow or inertial/mass rate and a fast or electric/information rate. Coherence and coordination of material systems depend on the communication of information at the fast rate.

II. Systems possess inate or natural rates and respond to external or imposed rates. The results are beat frequencies beteen the two rates. [Stress may be the result of the beat frequencies]

III. The general theory of relativity demonstrates that the existence of matter effects and affects the existence of space-time. Hence associated with every particle of matter is both a ruler and a clock. The ruler determines the scale and curvature of local space, the clock provides a local zeitgeber for coherence of any systems present and sets a temporal scale.

Is the source of time built into all organisms, or are we really being driven by the earth clock outside us?
--Avini, Empires of Time p29

{[If CHON is the zeitgeber, can we then detect physical changes at the atomic and molecular levels having CHON periodicities? Any changes would have to be detected in individual atoms or molecules, because in aggregates it is highly improbable that the phases of the cycles would be the same. The statistical aggregation of random phases would wash out detectability of the cycles. For periodicities to be manifested in aggregates the atoms and molecules would have to be coherent, i.e. their individual periods would have to be in phase. However, there do exist molecular aggregates which manifest periodicities. We call these aggregates living organisms. We are led to the surmise, consistent with what we know about biological clocks, that the zeitgeber lies within every atom of the organism. We may further speculate that **coherence** of atomic zeitgebers is a property of living systems. When the coherence diminishes, ageing takes place and when it reaches a certain level of randomness, death occurs.

In living systems the zeitgebers are in phase, they exhibit coherence.
In inanimate systems the zeitgebers are random.
The fountain of youth is the resynchronization of the zeitgebers.]}

This entire scrap must be relocated ABOUT MEASUREMENTS

TIMEFGR.WP6 96/03/14 rev: 96/04/28

WHY DOES ~~IS~~ EVERYTHING APPEAR TO BE SPEEDING UP ?

SOME PRELIMINARIES:

Measurement consists of the comparison of two quantities, one being the immediate specific object being measured the other being a standard which provides a unit; e.g. the length of a table compared to a standard meter. Measurement thus is a special case of **figure and ground** in the sense that ground is a context that provides, not only scale, but also meaningfulness to figure. Indeed it may well be asserted that both figure and ground are required in order for either meaningfully to have existence. see 96#24

The concepts implicit in measurement, in addition to units, standards, figure and ground, also involve **dimensionality** ~~and dimension~~. Physicists, for example, are usually concerned with the dimensionalities: mass M, length L, and time T. In the operation of measurement the quantity measured and the standard must have the same dimensionality. Their comparison results in the ratio, (object ÷ standard), which is a pure number, having no dimensionality. Yet after reduction to a pure number dimensionality is restored by labeling the resulting ratio a mass of so many grams or a length of so many centimeters, etc. We thus see that dimensionalities retain dimensionality in the operation of measurement in spite of becoming a pure numbers since a dimensional unit is afterwards assigned to the ratio. Time, for example, will be the ratio of two durations, one of which is a standard, such as the rotation period of the earth. In this case the resulting ratio, though a pure number, will be labeled so many days.

FIGURE TIME AND GROUND TIME:

In this section we shall consider some possibilities in placing two kinds of time in a figure/ground relationship. For any measurement the rule is that the two quantities being compared must have the same dimensionality and that what we label time is really a ratio of two time intervals. Let us note two physical functions both of which have the dimensionality of time. The first of these is derived from motion or velocity, and since Aristotle felt that all time and change was an inference of motion, we shall call this "Aristotle Time". Specifically, Aristotle's time t is given by

$$t = \frac{L}{c}$$

Where L is a length and c a velocity.

The second function having the dimensionality of time depends on mass density and since it is really a special case of Kepler's

third law, we shall call it "Kepler Time", and designate it by the Greek letter τ. Specifically

$$\tau = 2\Pi \frac{L^{3/2}}{\sqrt{GM}}$$

where L is a length, M is a mass, and G is a constant with dimensionality, $\left[\frac{L^3}{MT^2}\right]$

If these two times are related as figure and ground, that is what we experience as time is really the ratio T = t/τ, then the τ time provides a cosmic standard interval against which various local t times are configured.

proper time?

$$T = \frac{t}{\tau} \propto \frac{\sqrt{\rho}}{L}$$

wrong

This ratio tells us that if L increases the apparent interval between two events will decrease. For an expanding universe as a whole, L, the measure of the size of the universe is increasing, hence the ground period is increasing and this causes the figure period to appear to decrease. Hence everything appears to speed up. On the other hand in the neighborhood of a black hole L is decreasing and the local or figure time will decrease. As one moves into a black hole everything slows down.

See 1996#24 and many others on 2-times

WHY IS EVERYTHING SPEEDING UP ?

In this essay we will find it useful to make a distinction between **dimensionality** and **dimension.** Physicists are usually concerned with dimensionalities such as mass M, length L, and time T. We here specify that dimensionalities become dimensions through the operation of measurement; that is, through the operation of comparing two quantities of the same dimensionality one of which is a standard which defines a unit. While a measurement, the ratio of two quantities of the same dimensionality, is actually a pure number, having no dimensionality, we proceed to assign a unit to this pure number restoring its dimensionality and calling it a dimension. Time, for example, will be the ratio of two durations, one of which is a standard, such as the rotation period of the earth, in which case the resulting ratio, a pure number, will be labeled so many days. Thus the ratio of two dimensionalities is a dimension and the ratio of two dimensions is a pure number.

Measurement, the comparison of two quantities, one being a standard providing a unit, is sort of a special case of figure and ground. This in the sense that ground is a standard that provides, not a unit, but meaningfulness to the figure. We might even say that it requires both figure and ground for there to be existence itself. Here we want to consider some possibilities of placing two kinds of time in a figure/ground relationship.

Let us assume that what we call time is really a ratio of two time dimensionalities, t--Aristotle's time derived from motion, and τ--Kepler's time derived from density. These two times are related as figure and ground. That is what we experience as time is really the ratio t/τ. The τ time provides a cosmic standard interval against which various local t times are configured.

Aristotle's time t is given by

horizontal, motion

$$t = \frac{\cancel{d}}{\cancel{L}} \frac{L}{c}$$

Kepler's time τ is given by

ground, density

$$\tau = 2\pi \frac{L^{3/2}}{\sqrt{GM}}$$

Dividing, we find for fixed M,

$$\frac{t}{\tau} \propto \frac{1}{\sqrt{L^5}} = \frac{c}{2\pi} \frac{\sqrt{GM}}{L^{5/2}}$$

This ratio tells us that if L increases the apparent interval between two events will decrease. For an expanding universe as a whole, L, the measure of the size of the universe is increasing, hence the ground period is increasing and this causes the figure period to appear to decrease. Hence everything appears to speed up. On the other hand in the neighborhood of a black hole L is decreasing and the local or figure time will decrease. As one moves into a black hole everything slows down.

Expressing the time ratio in terms of the density, ρ, we have,

$$T = \frac{t}{\tau} \propto \frac{\sqrt{\rho}}{L}$$

From this equation we might have a resolution of the, "You can't be older than your mother", paradox. If L is the cosmic expansion, then the figure time is decreasing everywhere, but if in addition we are in a high density locality, such as a globular star cluster, the figure time will be even faster. Physical processes would run more rapidly and stellar evolution could take place in shorter times. So, "You can't be older than your mother", is true only if you and your mother have the same clock.

Redo
This is in error

If we use proper time $T = 1$

then for $\rho \uparrow$ $T > 1$ slow motion in appearance
but much happening between frames
i.e. many events

Synthesis to perform

Define: frame: recorded frame interval = t rate or frequency $\frac{1}{t} = f$
event: happened event interval = τ $\frac{1}{\tau} = \nu$

$T = \frac{t}{\tau}$ slow motion: many frames per event $t < \tau$, $T < 1$
time lapse: many events between frames $t > \tau$, $T > 1$

Slow motion	$Nt = \tau$	$N > 1$	$T = \frac{t}{\tau} < 1$	
Time lapse	$n\tau = t$	$n > 1$	$T = \frac{t}{\tau} > 1$	$\rho \uparrow$

i.e. in a high density domain
$T > 1$ many events occur
proper time (projection rate)
clock read, $t = 1$

If $\rho \downarrow$, then $T < 1$ and proper time clock read $t = 1$
and events appear in slow motion
$\Rightarrow$ less time to get anything done

TURBULENCE IN THE STREAM OF TIME

First it is necessary to distinguish between the ***present*** and the ***now***.
The Direction of Time:

The ***present*** is an instant of time that moves along the line of time in a direction past to future. This direction or "arrow of time" has been defined in terms of the second law of thermodynamics as the direction in which entropy increases. Associated with this direction of time is the concept of causality. The conventional assumption is: that which is subsequent can only be caused by that which precedes, or consequences do not play a causal role.
It is also recognized that living systems are able locally and temporally to violate the second law of thermodynamics. This property would infer that living systems can also effect conditions in which consequences can play a causal role. Indeed, this disposition in living organisms has been given a name, "purpose". [This purpose is not to be confused with a philosophical purpose of life, but is simply an agenda the organism has chosen to influence.]

The ***now*** is a zone within the stream of time in which the second law of thermodynamics has been violated. Within this zone antecedent-subsequent are no longer locked to cause-effect. Causality is free to move both from prior to later and from later to prior. Consequences may play a causal role. And living organisms seem to be able to create such "now zones". Whenever such a zone occurs in the stream of time it is in many respects analogous to turbulence in a fluid stream where the flow is in several directions at once. The ***now*** may be thought of as a turbulent eddy in the stream of time..

Two quotes are of interest in this connection:
Who controls the past controls the future; who controls the present controls the past.

—George Orwell 1984

History is what I write it to be.

—Joseph Stalin

An implication of these quotes is that people in a position of power more readily recognize this human capacity to locally and temporarily violate the second law of thermodynamics. But this power to overrule some aspects of the determinism or necessity present in the natural order is possessed to some extent by all life forms.

Notes:
The **present** is the period in which energy may be transferred. The **now** is the time zone in which information may be transferred. [or created]

The Hopi view of a determinator in the future may be considered the leading front of a now zone
The lagging front, liberation from the past, is more difficult to ascertain.
Questions:
Is there an holographic analogy in time where the part, a portion of time, may contain the whole?

Are there different topologies for time as there are for space?

82a
also 1996 #27

FRACAGE1.WP6 October 27, 1995 REV October 19, 1996

A FRACTAL AGE OF THE UNIVERSE

An alternate approach to determining the age of the Hubble universe is to consider its fractal nature; that is, properties of its parts being similar to those of the whole. Let us ask how long it would take for a Planck particle to expand to the size of a baryon, specifically, for the Planck length, $\sqrt{(Gh/c^3)}$ to grow to the size of the electron radius, r_e.
$\sqrt{(Gh/c^3)} = L_p = -32.791341$ and $r_e = -12.55068$ $\log_{10}$(cgs) values

What are the boundary conditions governing such expansion?

The Heisenberg uncertainty principle provides us with the inequality,

$$\frac{ML^2}{T} \geq h \qquad (1)$$

which places a lower bound on all action. The left member is equivalent to,

$$\frac{M}{L}\,\frac{L^3}{T} = \frac{M}{L}\,\frac{V}{T} \geq h \qquad (2)$$

where V is volume.

The Schwarzschild inequality $GM/c^2R \leq 1$, when substituted in equation (2) gives,

$$\frac{c^2}{G}\,\frac{V}{T} \geq \frac{M}{L}\,\frac{V}{T} \geq h \qquad (3)$$

This says that the <u>minimum</u> volume rate of expansion V/T is equal to $\Psi = Gh/c^2$, whose $\log_{10}$ value is -55.105861 cm^3/sec. This implies in turn that the <u>maximum</u> time taken for the expansion is $T = V/\Psi$ (Whether or not there is inflation). With $V = r_e^3 = -37.650205$, T becomes 17.455656 seconds or 9.056 billion years.

The value of 9.056 billion years is the age of the universe which corresponds to a Hubble Age of 13.584 billion years and to a Hubble constant of 71.994 km/sec/mpc.

PARTIME1.WP6 May 23, 1997

See 199415 1997#3

PARTICLES:TIME :: WAVES:FREQUENCY

Another venture into the jungle of juxtaposition. This time with frequency/time as wave/particle. Mathematicians have settled that frequency = 1/time, but could there not be more? In going from frequency to time may we not also be going from a wave to a particle manifestation. This seems to be the case in music. The horizontal time axis has a particulate nature consisting of entities distributed in time called notes. The vertical pitch axis references the frequency or wave nature of the notes. The human musician or 'observer' gets into the act by deciding where the time-to-frequency interchange should be located. For human music this seems to be somewhere in the interval eight to twenty hertz. That is for duration times less than about 1/20 sec we prefer to sense the frequency aspects.

Let us generalize from this music metaphor. By analogy, every entity from atoms to the cosmos, like every note, has associated with it both a duration in time and a wave pattern. While this time-frequency parameter may be singular for every entity, the t<-->f interchange is set by the t<-->f of the observer. In the abstract world in which mathematicians exist, they always set t<-->f at one. For humans the time side of the divide is usually called the lifetime of the entity, the wave side the frequency range of the entity. In general, the larger the entity, the greater its age, the smaller the entity the higher its frequency. The Planck particle has f = 10^{42} hertz.

conjecture:
Surmise: For every entity: $h\nu + (mc^2 \times d)$ = a constant, where h is Planck's constant, ν the frequency, m the mass, c the velocity of light, and d the life time.

An alternate approach holds that, instead of the time-frequency parameter being singular, there is either TDMA or FDMA (or both) multiplexing going on. In the TDMA version, every entity oscillates back and forth between its wave manifestation and its particle manifestation at some unknown frequency. In the FDMA version, every entity exists at two or more frequency levels. In this view a singular frequency spectrum could not even exist.

cf. Pythagoras and Nagarjuna

Another TDMA multiplexing model would have an information vs. energy oscillation occurring at some unknown frequency. Somehow every material form must be continually refreshed by being supplied both energy and information. This view holds that information-energy, time-frequency, and wave-particle are each two sides of a coin. [of how many coins?, one, two, or three?]

This assumption, a statement that all matter in ordinary state lies along the α^2 potential bound, says that the gravitational radius, $GM/c^2 = k\alpha^2 R$, or that $R = KGM$, where K is a constant. Substituting KGM for R in equation 1) gives,

(7) $$\tau = 2\pi\sqrt{\frac{(KGM)^3}{GM}} = 2\pi K^{3/2} GM$$

That is, the period τ for ordinary matter is closely proportional to the mass, and since $\tau_H = 2\pi K^{3/2} G m_p$,

(8) $$\frac{\tau}{\tau_H} = \frac{2\pi K^{3/2} GM}{2\pi K^{3/2} G m_p} = \frac{M}{m_p} = A$$

where A is the atomic weight. Using this result, $\tau_A = A\tau_H$, we can construct the following table:

ELEMENT	ATOMIC WEIGHT	SCHUSTER PERIOD
HYDROGEN	1.0080	2hr 0m 40sec = 1/12 day
CARBON	12.0112	24hr 9m 20sec = 1 day
NITROGEN	14.0067	28hr 10m 7sec = 7/6 day
OXYGEN	15.9994	32hr 10m 33sec = 4/3 day
POTASSIUM	39.102	78hr 38m 16sec = 13/4 day

We now introduce a third assumption:

Assumption 3] Gravitational periods are to be combined according to the Diophantine rule, $n_1\tau_1 = n_2\tau_2$, where n_1 and n_2 are integers.

This assumption leads to the following values for the combined, or beat, periods:

ATOMIC COMBINATIONS	PERIODS
$1\tau_C = 12\tau_H$	$\tau_{CH} = 1$ day
$7\tau_{CH} = 6\tau_N$	$\tau_{CHN} = 7$ days
$4\tau_{CHN} = 7\tau_O$	$\tau_{CHON} = 28$ days
$13\tau_{CHON} = 112\tau_K$	$\tau_{CHONK} = 364$ days *

We note that the elements most abundant in and important to living organisms give rise to the common periods of time derived from the earth's motions. *[More precisely, 366 1/3 days.]

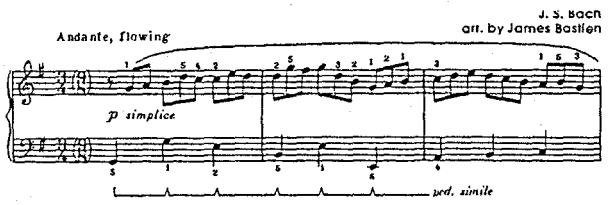
C

MUSICTF.WP6 January 6, 1997

See 1994 #5
1997 #32

F
ON TIME AND FREQUENCY

Whenever I look at a piece of sheet music, I am intrigued by how the symbolism of music shows us ~~that~~ where we invariably discriminate and separate time from frequency (or pitch as musicians prefer to call it).



In written music, time moves from left to right horizontally, while pitch goes vertically from bottom to top as frequency increases. We understand that pitch or frequency is the reciprocal of time, f = 1/t. So pitch and duration are just two different ways of looking at time. Why do we view time in these two distinct ways and how do we decide where to stop viewing time as duration and changeover to view time as pitch? Is there more involved than just inverting the 1/t equation? The equation tells us that there are as many frequencies between zero and one as there is time from one, or now, to infinity. But what is **one**, what does **one** stand for?

Depending on the loudness, the average human ear can hear sounds from about 20 hertz (cycles/second) to 16,000 hertz. Depending on the tempo there can be up to about M.M.240, that is at extreme prestissimo, about 240 quarter notes per minute. This value is equivalent to a quarter note having a duration of one quarter of a second, an eighth note one eighth of a second, a sixteenth note one sixteenth of a second, etc. Here the time durations of notes are approaching the same values as the frequencies we hear at the lowest levels of pitch. So it appears that somewhere in the range say 8 to 16 hertz we make the switch of preference between time and frequency.

The second is the shortest time unit that humans find useful to measure sensory experience, (nanoseconds and femtoseconds are for computers). We express time periods longer than a second in numbers of seconds, (or in units of multiple seconds, such as minutes, days, years). But we express time periods shorter than a second in frequency units or hertz. (There is, however, an ambiguous region between about 1 second and 1/20th second (or 20 hertz) where both systems are used. Also note here that the number of motion picture frames per second needed to create for us the illusion of continuous motion is from 8 to 16). Evidently then, there is something fundamental in the internal human clock that switches in this zone.

One hypothesis is that humans use the Schuster Electron Time[1] [SET] of 0.121 second as a zeitgeber. Since this value is very close to 1/8 second, we might say that [SET] is the metronome that governs our time sense. We switch to frequency representations at times shorter than [SET] and to duration representations at times longer than [SET]. It is probably not fortuitous that the duration value of the second is near this period, but it does seem fortuitous that this value is related to the rotation period of the earth.

Another matter of interest in the musical utilization of time and sound is that in both the duration and pitch zones there are intervals of silence. In the horizontal zone, there is a brief silence between the sounding of each note. (One classical composer held that the whole purpose of music was to give quality to these intervals of silence). In the vertical zone there are non-pitch intervals between the values of pitch that are set by scales or modes. All of this is present in our music, but somehow musical notation obscures it from us. But then there are no symbols that carry all the reality of that which they symbolize.

---

1) The Schuster Electron Time [SET] is a period associated with an electron based on the electron's mass rather than on its charge. The frequencies we usually associate with atomic phenomena derive from coulomb forces and are of the order of 10^{16} hertz. The [SET] derives from mechanical forces and has a value close to perception times of ordinary experience. The value of [SET] is given by

$$t = 2\pi\sqrt{\frac{r_e^3}{Gm_e}} = 0.121\text{sec}$$

where r_e is the radius of the electron, m_e is its mass and G is the gravitational constant.

TIMENER1.WP6 January 14, 1997

TIME AND ENERGY

One of the forms that the Heisenberg uncertainty inequality may take is:

$$\Delta T \times \Delta E \geq h$$

where T is time, E is energy and h is Planck's constant. The conventional interpretation of this result is if the time interval is known precisely, the amount of energy is uncertain or if the energy is precisely known, the time is uncertain. But as with all mathematical results many interpretations are possible. In fact that is the power of mathematics--the same equation can be applied to many things. Here we look at two additional interpretations.

This inequality is in all its interpretations a description of a tradeoff. Heisenberg's initial interpretation was about a tradeoff in certainty. Another interpretation is a tradeoff in efficiency. Time efficiency is inversely related to energy efficiency. If we want something done in a short time, its costs in energy go up. If we want to be economical with energy, then we must be prepared to be patient. A jet across the continent is quick but energy expensive; a bus with the same load, longer time, less energy. In all of our efforts to save energy we must realize that we are first going to have to give up our demand for instant results. But we have become the 'now' generation and we have yet to realize the cost in energy. Hence:

If you want to save energy, you are going to have to slow down.

A second tradeoff implicit in the equation has to do with the future. Let us call it a tradeoff in influence. A small effort by an individual or group can in the long run effect tremendous change. Or as Margaret Meade said: *"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever does"*. This point has been emphasized in chaos theory. In fact the so-called butterfly effect, "*The manner a butterfly flaps its wings in Kyoto today will alter the weather in London thirty days hence",* is an essential part of chaos theory. There are many historical examples of the time-energy tradeoff in influence, such as that of a handful of Palestinian fisherman, or a man in the English country side observing an apple fall. The closer to the present you want your influence, the greater the energy required. We need only point to such as Genghis Khan and Hitler who wanted the results in their own life time. Ideas with low energy cost of diffusion, such as word of mouth, require longer times to spread, while rapid diffusion demands expensive media costs. Hence:

If you want to influence, act now in moderation but ignore the time table.

"There is no idea, however ancient or absurd, that is not capable of improving our knowledge."

Paul Feyerabend

The epistemological anarchist, Feyerabend, supports any source for obtaining hypotheses, even buying them from the leprechauns provided the price is right. The following is an attempt to find a hypotheses by putting two equations in juxtaposition: a well known arithmetic relation and Kepler's third law, with the hope that they will start a dialogue.

First, the arithmetic relation:

time aggregation — space aggregation

$$(1+2+3+\ldots+n)^2 = 1^3+2^3+3^3+\ldots n^3$$

Prove by Mathematical Induction

Next, Kepler's Third Law:

$$GM\,T^2 = R^3$$

A parallel is suggested when we adopt the following forms:

$$\frac{(\Sigma m)^2}{\Sigma m^3} = \frac{(\Sigma n)^2}{\Sigma n^3}$$

and,

$$\frac{T_m^2}{R_m^3} = \frac{T_n^2}{R_n^3}$$

If there is a dialogue, it says that both time and three dimensional space aggregate linearly, but the square root of space must be taken to obtain dimensional correspondence with time. Something here suggests that Pythagoras was right when he claimed that at the root of all physical laws are the properties of number.

KALPASUP.WPD July 8, 2005

HUBBLE AND THE KALPAS

The units of the Hubble parameter, H_o, are in kilometers/second/megaparsec.
One megaparsec is equivalent to 19.489352 kilometers [$\log_{10}$ value]
Hence an $H_o = 1$ is equal to -19.489352 sec^{-1}
Or an $H_o = V$ gives a frequency of logV -19.489352 sec^{-1}, or a time of 19.489352 - logV sec

The current value proposed for the Hubble constant, H_o, is about 72 km/sec/mpc.
Let us use the value $H_o = 71.994$[1] . From this value we get a Hubble time of 13.584465 B.Y.
This corresponds to an age of the universe of 9.056310 B.Y. , with $\log_{10}$ value = 0.956951 B.Y
This is equivalent to 9.956951 years or 17.456064 seconds ($\log_{10}$ values)

A Kalpa or day in the life of Brahma is defined as 4.320×10^9 years
[with a $\log_{10}$ value of 9.635484 years = 17.134596 seconds]
If the age of the present Brahma began with the Hubble time, then

the first Kalpa began	13.584×10^9 years ago	Big Bang
the second Kalpa began	9.264×10^9 years ago	First generation stars
the third Kalpa began	4.944×10^9 years ago	Second generation stars, sun
the fourth Kalpa began	624×10^6 years ago	In the Sinian Era[2]

The present Brahma is now in his fourth day.

On the other hand, if the universe began about 9.056310 billion years ago, then the lifetime of the present Brahma began with the Big Bang and:

the first Kalpa began	9.056×10^9 years ago	Big Bang
the second Kalpa began	4.736×10^9 years ago	Age of sun
the third Kalpa began	416×10^6 years ago	in the Silurian period[3]

The present Brahma is now in his third day.

---

[1]This value of the Hubble parameter derives from the assumption that the age of the universe is given by $(r_e/l_o)^3 t_o$, where r_e is the electron radius, l_o is the Planck length and t_o is the Planck time.

[2]The Sinian era was from about 800 to 570 million years ago, time of the oldest animal fossils. The Cambrian Period began 570 million years ago, with the great Cambrian radiant at about 530 million years ago.

[3]The Silurian period , 439-409 million years ago, time of the first land plants. [The first recorded extinction was about 440 million years ago.]

LARGNUMB.WPD JUNE 11, 2000

KALPAS AS UNITS OF TIME

While we know that the ancients developed systems for expressing large numbers, we are ignorant of any practical applications for which they needed large numbers. Particularly, we recognize the creativity of Archimedes in his "Sand Reckoner" and of unknown Hindu mathematicians in their development of the system of yugas and kalpas. Today we have many uses for large numbers to express social, economic, and scientific quantities and have developed a convenient representation by expressing them as powers of ten. For example, one billion = 1,000,000,000 = 10^9. In our culture, astronomy has long been the cradle of large numbers, for distances, numbers of stars and other objects, and for their ages. With recent focus on the cosmological importance of the age of the universe, (derived from its rate of expansion), it is of interest to see what modern age numbers might look like when expressed in terms of ancient units like yugas and kalpas, which were used to represent great lengths of time.

THE HINDU TIME SYSTEM

Brahma, the creator of the universe, is supposed to have a lifetime of 100 Brahma Years, each of 360 Brahma Days. The length of one Brahma Day is called a kalpa and is 4.32×10^9 earth years. This would make Brahma's lifetime equal to about 156×10^{12} earth years. It is held that at the end of such a period the world disappears to be replaced by a new world with a new Brahma. But there are subdivisions to the kalpa or Day of Brahma. One kalpa is equal to 1000 mahayugas, each of which would be of length 4.32×10^6 earth years or of 12,000 so-called Divine Years. This works out to one Divine Year = 360 earth years, [$360 \times 12{,}000 = 4.32 \times 10^6$] Each mahayuga consists of four yugas, each successive yuga is of decreasing length, containing increasing strife and conflict. The first yuga is the Krta Yuga whose length is 4000 Divine Years, [1,440,000 earth years]; the second is the Treta Yuga of 3000 Divine Years, [1,080,000 years]; the third is the Dvapara Yuga of 2000 Divine Years, [720,000 years]; and the last is the Kali Yuga of 1000 Divine Years, [360,000 years]. These add up not to 12,000 Divine Years, but to only 10,000 Divine years. The discrepancy is explained in terms of "yuga dawns and twilights".

THE 20TH CENTURY COSMOLOGICAL SYSTEM

For most of the 20th century, cosmologists have been using a model based on a "critical density"; critical in the sense that if exceeded, the universe will oscillate between a series of big bangs and big crunches, and if deficient, will expand forever. The jury is still out, but at the beginning of the 21st century, the smart money is on insufficient matter and eternal expansion. In this model we are concerned with three quantities:

1) An observable: the Hubble parameter, H_o measured in kilometers/second/megaparsec.
2) An interval of time called the Hubble Age, A, the time from the present back to an origin assuming constant rate of expansion at the present rate, measured in billions of years.
3) The so-called age of the universe, T, the time from the present back to the big bang, measured in billions of years.

These quantities are related as follows:

(H_o in km/sec/mpc) x (A in billions of years) = 978; and $T = 2/3\ A$

KALPAS AS UNITS OF TIME

The table shows the relations between the Hubble parameter, H_o; the Hubble time or age, A; the time since the big bang, the so-called age of the universe, T; with $\log_{10}$ values.

H_o km/sec/mpc	A Gyr	T Gyr	log T years	log T seconds
1) 550	1.8	1.2	9.079	16.578
2) 71.99	13.58	9.056	9.956955	17.456067
3) 75.46	12.96	8.64	9.936514	17.435626
4) 150.93	6.48	4.32	9.635484	17.134596
5) 4.1924×10^{-3}	233,280	155,520	14.191786	21.690898

1) Hubble's first value [Realm of the Nebulae p168, 1936]
2) Current value based on Cepheids [Friedman et al, 1999] This value = $(\alpha\mu S)^{3/2}\, t_o$
3) Value corresponding to 2 kalpas
4) Value corresponding to 1 kalpa
5) Value corresponding to "Lifetime of Brahma"
[log number of seconds in year = 7.499112]

10^5 billion years

Notes: The age of the earth is estimated to be about 4.5 Gyr which is close to one kalpa, which means the earth was born toward the end of the first Day. The sun is estimated to be about 4.7 Gyr, though a second generation star, it was still born in the first Day. The age of the universe 2) is "slightly" over two kalpas. Meaning we have been in the third Day of Brahma for 0.42/4.32 = 0.097 Day, that is for about 420 million years. This means the third Day of Brahma began 420 million years ago in the Silurian period, the age of first appearance of vertebrates, the fishes, and the first seedless land plants and ferns. Since the beginning of the third Day, there have been 97 mahayugas (out of 1000 per Day). The 98th mahayuga of the third day began 960,000 years ago in the Pleistocene epoch. This was the time of homo erectus well before homo neanderthalensis and homo sapiens. But since 960,000 years is less than 1,440,000 years of a Krta Yuga, we are still in a Krta Yuga, with 680,000 years to go. That should be good news for all of us.

If we define the Planck Age, P_A, as +43.268366 seconds, and take the total number of Brahmas, past, present, and future, B_N, as having the same numerical value as the lifetime of Brahma, B_L in seconds = 21.690898, then $B_N \times B_L = +43.381796, \sim P_A$. [$\log_{10}$ values]

The difference must lie in the Yuga durations and twilights [C]

While the use of kalpas has no advantage over our powers of ten notation, it does help to put relative lengths of time into perspective by reducing billions and millions of years to days and hours. Since the big bang we are now only two hours and 20 minutes into the third Day of Brahma.

PLNUMB12

SECOND QUADRANT

FIRST QUADRANT

	INUNIV	Y	Q	BARYON	PLANCK	DARK	STAR	X	UNIVERS
MASS	-62.004998		-42.890800	-23.776602	-4.662404	14.451794	33.565992		52.680194
LENGTH	27.932478		7.691205	-12.550068	-32.791341	-12.550068	7.691205		27.932478
M/L	-89.937476		-50.582005	-11.226534	28.128937	27.001862	25..874787		24.747712
AREA	55.864956		15.382410	-25.10013	-65.582682	-25.100136	15.382410		55.864956
M/L^2	-117.86995		-58.273210	1.223534	60.920278	39.551430	18.183582		-3.184766
VOLUME	83.797434		23..073615	-37.65020	-98.374023	-37.650204	23..073615		83.797434
DENSITY	-145.80243		-65.964414	13.873602	93.711619	52.101998	10.492377		-31.117244
TIME L/c	17.455657		-2.785616	-23.026889	-43.268162	.-23.026889	-2.785616		17.455657
ENERGY	-41.051357		-21.937159	-2.822961	16.291237	35.405435	54.519633		73.633835
E/V	-124.84879		-45.010774	34.827243	114.665260	73.055639	31.446018		-10.163599
FORCE	-68.983835		-29.628364	9.727107	49.082578	47.955503	46.828429		45.701355
GRVITY	-187.05030		-108.339306	-29.628337	49.082578	46.828428	44.574178		42.320128
GM^2/L^4	-242.91520		-123.721714	-4.528227	114.665260	71.928567	29.191879		-13.544819
POWER	-58.507014		-19.151543	20.203928	59.559399	58.432324	57.305249		56.178178
TEMP	-25.191441		-6.077243	13.036955	32.151153	51.265350	70.379548		89.493750

$$\frac{GM^2}{L^4} = \frac{M}{LT^2} = \rho c^2 = \frac{E}{V}$$

errors in chart?

TIMATRX6.WPD

TIME TABLE: T=T(G,M,L,ħ,c)

[T] = 1

M\L	–3/2	–1	–1/2	0	1/2	1	3/2
+3		$\sqrt{G^5M^6/L^2hc^{11}}$		G^2M^3/hc^4		$\sqrt{G^3M^6L^2/h^3c^5}$	
2.5	$\sqrt{G^5M^5/L^3c^{12}}$		$\sqrt{G^4M^5/Lhc^9}$		$\sqrt{G^3M^5L/h^2c^6}$		$\sqrt{G^2M^5L^3/h^3c^3}$
+2		G^2M^2/Lc^5		$\sqrt{G^3M^4/hc^7}$		GM^2L/hc^2	
1.5	$\sqrt{G^4M^3h/L^3c^{11}}$		$\sqrt{G^3M^3/Lc^8}$		$\sqrt{G^2M^3L/hc^5}$		$\sqrt{GM^3L^3/h^2c^2}$
+1		$\sqrt{G^3M^2h/L^2c^9}$		GM/c^3		$\sqrt{GM^2L^2/hc^3}$	
+1/2	$\sqrt{G^3Mh^2/L^3c^{10}}$		$\sqrt{G^2Mh/Lc^7}$		$\sqrt{GML/c^4}$		$\sqrt{ML^3/hc}$
0		Gh/Lc^4		$\sqrt{Gh/c^5}$		L/c	
-1/2	$\sqrt{G^2h^3/ML^3c^9}$		$\sqrt{Gh^2/MLc^6}$		$\sqrt{Lh/Mc^3}$		$\sqrt{L^3/GM}$
-1		$\sqrt{Gh^3/M^2L^2c^7}$		h/Mc^2		$\sqrt{L^2h/GM^2c}$	
-3/2	$\sqrt{Gh^4/M^3L^3c^8}$		$\sqrt{h^3/M^3Lc^5}$		$\sqrt{Lh^2/GM^3c^2}$		$\sqrt{L^3hc/G^2M^3}$
-2		h^2/M^2Lc^3		$\sqrt{h^3/GM^4c^3}$		Lh/GM^2	
-5/2	$\sqrt{h^5/M^5L^3c^7}$		$\sqrt{h^4/GM^5Lc^4}$		$\sqrt{Lh^3/G^2M^5c}$		$\sqrt{L^3h^2c^2/G^3M^5}$
-3		$\sqrt{h^5/GM^6L^2c^5}$		h^2/GM^3c		$\sqrt{L^2h^3c/G^3M^6}$	

Notation: In the above table h is used for ħ, the Planck constant / 2π .

$\sqrt{}$ is for entire expression

TIMATRX4.WPD November 8, 2009

TIME TABLE: T=T(G,M,L,ħ,c)

[T] = 1

M\L	0	0.5	+1	1.5	+2	+2.5	+3
+3	G^2M^3/hc^4		$\sqrt{G^3M^6L^2/h^3c^5}$		GM^3L^2/h^2c		$\sqrt{GM^6L^6c/h^5}$
+2.5		$\sqrt{G^3M^5L/h^2c^6}$		$\sqrt{G^2M^5L^3/h^3c^3}$		$\sqrt{GM^5L^5/h^4}$	
+2	$\sqrt{G^3M^4/hc^7}$		GM^2L/hc^2		$\sqrt{GM^4L^4/h^3c}$		M^2L^3c/h^2
+1.5		$\sqrt{G^2M^3L/hc^5}$		$\sqrt{GM^3L^3/h^2c^2}$		$\sqrt{M^3L^5c/h^3}$	
+1	GM/c^3		$\sqrt{GM^2L^2/hc^3}$		ML^2/h		$\sqrt{M^2L^6c^3/Gh^3}$
+1/2		$\sqrt{GML/c^4}$		$\sqrt{ML^3/hc}$		$\sqrt{ML^5c^2/Gh^2}$	
0	$\sqrt{Gh/c^5}$		L/c		$\sqrt{L^4c/Gh}$		L^3c^2/Gh
-1/2		$\sqrt{Lh/Mc^3}$		$\sqrt{L^3/GM}$		$\sqrt{L^5c^3/G^2Mh}$	
-1	h/Mc^2		$\sqrt{L^2h/GM^2c}$		L^2c/GM		$\sqrt{L^6c^5/G^3M^2h}$
-3/2		$\sqrt{Lh^2/GM^3c^2}$		$\sqrt{L^3hc/G^2M^3}$		$\sqrt{L^5c^4/G^3M^3}$	
-2	$\sqrt{h^3/GM^4c^3}$		Lh/GM^2		$\sqrt{L^4hc^3/G^3M^4}$		L^3c^3/G^2M^2
-5/2		$\sqrt{Lh^3/G^2M^5c}$		$\sqrt{L^3h^2c^2/G^3M^5}$		$\sqrt{L^5hc^5/G^4M^5}$	
-3	h^2/GM^3c		$\sqrt{L^2h^3c/G^3M^6}$		L^2hc^2/G^2M^3		$\sqrt{L^6hc^7/G^5M^6}$

Notation: In the above table h is used for ħ, the Planck constant / 2π .

$\sqrt{}$ is for entire expression

2002 #70 revised

CAUSALITY AND THE DIRECTION OF TIME

Who controls the past controls the future; who controls the present controls the past.
—George Orwell 1984

The Direction of Time:

Does time always move from past to future? The direction or "arrow of time" has been defined in terms of the second law of thermodynamics as the direction in which entropy increases. And locked into this direction of time is the concept of causality. We conventionally assume that causality must operate in the same direction as the flow of time, meaning that consequences never play a causal role. But in the case of living systems, it is recognized that they are able, locally and temporally, to violate the second law of thermodynamics. This capability of living systems infers that they may also, locally and temporally, be able to alter the direction of time. This carries the additional implication that living systems can create situations in which consequences do play a causal role. Indeed, this concept of the power of living organisms to reverse the direction of time and causality has been given a name, "purpose". Living systems do direct sequences of events toward selected goals which conflicts with the idea that the future is solely determined by past causes. A power to overrule some aspects of the determinism or necessity present in the natural order seems to be possessed to some extent by all life forms.

The Present and the Now:

We distinguish between the **present** and the **now**. We may define the **present** as an instant that moves along the line of time in a direction past to future, but at possibly different rates. We define the **now** as a zone in the stream of time in which the second law of thermodynamics has been locally violated. Within this zone antecedent-subsequent are no longer locked to cause-effect. Causality is free to move both from prior to later and from later to prior, and consequences may play a causal role. Living organisms seem to be able to create such "now zones". Whenever such a zone occurs in the stream of time it is in many respects analogous to turbulence in a fluid stream where the flow may be in several directions at once. Such an intentionally controlled zone or interval of time may be thought of as a turbulent eddy in the stream of time..

Notes:

- The **present** is the only period in which energy may be transferred. The **now zone** is the time interval in which information may be transferred. [and/or created]
- The Hopi view of a determinator in the future may be considered the leading front of a now zone

Questions:

Is there an holographic analogy in time where the part, a portion of time, may contain the whole?
Are there different topologies for time as there are for space?

RETURN TO TIME

Time is a subject to which I repeatedly return over the years. I feel that culturally we have swept much undifferentiated experience of change under the single rug we call time. We have reduced all species of change to one kind of change–the change of position, i.e. the change produced by motion. And our concept of time is derived from particular properties of motion. This motion type of time, called Chronos by the Greeks, has become the exclusive time of Western culture, the time of Aristotle, Newton, Minkowski, and Einstein. While it had its beginnings in Greek thought, it also had rivals. Before a cultural consensus was achieved, there were heady disputes about the nature of time such as those between Herakleidos and Parmenides. And there were persistent dissidents like Zeno who speculated on alternative relations between events and change. The refusal of the Greek dissidents to grant exclusiveness to Chronos was based on their reverence for another kind of time they called Kairos. While chronos was purely quantitative, kairos preserved the qualitative dimensions of time. Another ancient culture, the Hebrew, also made this distinction, that between historical time (chronos) and qualitative time (kairos), described in Ecclesiastes 3:1-8.[1]

A residue of the difference between chronos and kairos is found today in the difference between linear time and cyclical time. Linear time consists of the counting of the ticks of the clock or the number of days, years, centuries, ... ,eons. But what is being counted? In each case some cycle, or some return to a previous place. This leads to the notion of cycles within cycles within cycles [or wheels within wheels with wheels...] as being closer to what is being measured by clocks, calendars, Carbon 14, isotope ratios, Hubble parameter, etc. than something that is purely linear. Kairos maintains that quality emerges from the superposition of the cycles. When certain cogs on a wheel return to meet with specified cogs on another wheel the quality of the moment is affected–a resonance effect. But the Mayans saw this more clearly than the Greeks. They created specific wheels corresponding to cycles of different length that allowed them both chronos [long count] and kairos [short count].

But our experience of change other than that caused by motion–such as, growth, decay, mutation, evolution, etc.[2] may involve more parameters than either the Greeks or the Mayans perceived, and go beyond both the linear and the cyclical. For example, non-localization in quantum mechanics disputes the velocity ≤ c time inferred limitation on information exchange, allowing instant transfer over any distance. If the distance factor is removed from velocity, then all of our traditional motion derived time becomes but a special case.

---

[1] The Jews have two new years days, the first of Nisan, the first month, and Rosh ha-Shanah. These speak to the existence of two kinds of time. Rosh ha-Shanah is a celebration of the beginning of time, a linear time, while the yearly cycle begins with Nisan and springtime.

[2] Of course, all of these changes may be attributable to different kinds of motion, hence to special cycles contained within traditional time.

SAMHAIN.WPD

MARCH 28, 2000
[January 18, 1999 @ 6704]

TIME AND REALITY

Samhain, in today's calendar, November 4th, when the passage between realities is most facile, when the sun is at its western most solstice, when the solar motion is purely southward. The time when beings from other realities come into our reality and we may go to theirs.

I have had many brief glimpses of these visitors who come here, [or was it I who visited them?]. But always they are motionless as though the clock in their reality beat much more slowly than the clock in ours.

The entire matter of alternate realities seems to involve aspects of time. However, time as we understand it is but a part of one dimension of a structure that is a complexity of many dimensions. Our understanding is that of a linear creature's understanding of three dimensional space. [Not even so good as a flatlanders understanding of three space.]

Let us speculate. One hypothesis is that there are many parallel realities, each operating at a different frequency, but all superimposed in the same 3-dimensional space. [This is like the communication engineer's FDMA, Frequency Division Multiple Access .] For example we share the same world with mountains that march to the drummer who beats the tempo in eons, with fruit flies whose life time is a matter of hours, and with clouds whose activities are measured in minutes. And of course we not only share, but are one with, the micro world of atoms and particles the hands of whose clocks move in nano and pico seconds. Why are we fascinated with artifacts like lava lamps whose blobs evolve at a rate that is so unusual for the rates of our reality. Why are we fascinated with speed: Mach 2 jets, Racing cars, skiing down slopes? Is it because these give us a hint of the presence of other realities somehow related to ours through a difference of clock rate or frequency? And at the other pole, there are the mystics, who by meditation slow the clock, entering alternate realities that emerge from stillness and silence.

size ~~to~~ rate

Can we fabricate a model of time that will fit all of these marginal glimpses of other realities, the thrills of speed, the psychic insights of stillness, the passages at Samhain? Can we visualize the Reality of which all realities are but facets? It has been said that an ontology [i.e. a description or model of a reality] depends on an epistemology [i.e. a methodology or way of knowing]. An epistemology is a humanly fabricated tool, helping us to know and explain, to feel and understand our experience. It is at once a window and a mirror, an opening through which we view the world and yet can see in it a reflection of our capabilities and our limitations. What we see through the epistemological window leads us to an ontology, a description of that which we are a part. What we see in the epistemological mirror is the nature of our own psychology and culture.

NOWIDE2.WPD June 6, 2003

THE WIDTH OF NOW

SOME UNSCIENTIFIC EXPLORATIONS

In 'Causality and the Direction of Time'[1], the concept of a **now-zone** was proposed as an interval of time in which past and future were interchanged, *histeron proteron*, and consequences could be causes. It was ventured that living systems' ability to locally and temporally violate the second law of thermodynamics, reversing or suspending time's arrow, made it possible to create such now-zones. But there is further evidence that supports the possible existence of now-zones. Both theory and experiments in quantum mechanics substantiate the concept of "non-locality". Whereas it is **spatial non-locality** that has been emphasized and experimentally validated, in contemporary physics with time considered as co-dimensional with space, the idea of **temporal non-locality** is also on the table. If non-locality be proven for time as well as space, an inference would be the existence of now-zones.

But, if this be so, how are such zones to be created? It is proposed that humans have for millennia used **ritual** to create now-zones and that the nature of the ritual determines the width of the zone. For example, when the president goes before congress and speaks on the state of the union he is participating in a ritual that expands the time duration of one evening into a period of time that brings the past year and the year ahead into a now-zone. In doing this in the gathered assemblage somehow a power is created that can shape the future. Further, in those rituals of higher drama when a president goes before congress to ask for a declaration of war, the duration of the immediate event expands itself to include the entire history of the republic and its destiny for decades to come. In bringing future and past into a now-zone of whatever width human purpose can transcend the confinements of linear time.

Humans engage in a broad spectrum of rituals, from reciting a brief mantra to inauguration or coronation rituals that may last for days. In each case a now-zone is created in which the energy in the dynamic power of linear time is somehow extracted and converted into another form of energy that enables transcendence of the rule of necessity that is implicit in the second law of thermodynamics.

The power of Faith or belief has been recognized by all religions as capable of overruling the intrinsic determinism residing in the inanimate portion of the universe. It may be that the rituals of faith are the actual source of the power of faith. The creation of now-zones by rituals such as a Eucharist, Yom Kippur, a Hajj, or personal meditation and prayer results in the release and transformation of the linear time energy. As has been said, "When two or three are gathered" or "Never doubt that a small group of thoughtful, committed citizens can change the world; indeed it's the only thing that ever has."[2]

It appears that what we are here calling a now-zone or temporal non-locality, the ancients called **eternity.**

---

[1]Scrap 2003 #2

[2]Margaret Mead

PERIHEL.WPD

PERI.WPD

TIME

#89

October 11, 2003

KRONOS and KAIROS & rewrite of earlier file

The year is a great cycle, with the patterns of movement of the sun repeated over and over, giving us the seasons, times of light and darkness, times of heat and cold, and times filled with more subtle effects. Primitive and pagan peoples celebrated the year for its visible and invisible happenings, the extremes of the solstices, the balance of the equinoxes, and the numinous times of the presence of the spirit of the earth.

January 4th On or about this date the earth moves closest to the sun, the point in its orbit called perihelion. Also on this date the motion of the sun in the sky changes from being dominantly eastward to northward. It is the annual tropos when the sun truly begins its northward journey. And at the latitude of Alexandria and roughly throughout the world's temperate zone, this is the date of latest sunrise, the day of the darkest morning. It is not surprising then that in many cultures, peoples sensed a day of basic cosmic significance and supplied historical or mythic reasons to celebrate it. The point in all of this is that most of our special days are indeed special, but what we project or attach to them and what we tell ourselves is the reason for our celebration can be quite unrelated and arbitrary. What here emerges is an awareness of two different ways of looking at time. One, time as linear, historical, and ongoing–Chronos; the other, time as cyclical, recurring, and renewing–Kairos.

The ancient Hebrews were credited with departing from the level of celebration of the raw cyclical year to a level of substituting for the sun-earth-moon events a set of historical happenings-Passover, Purim, Rosh a shanah, ...Christians followed this practice, Easter, Christmas, Epiphany,... using a different set of historical or mythic events. And this practice prevails today in the West. Our national festivals mark anniversaries, birthdays or historical events.
But in this mode of celebration we have lost touch with the underlying cosmic cycles, with the real basis for Kairos-the proper time to celebrate the different aspects of life- and that may have little to do with history. In celebrating Christmas, for example, as an historic event, we obscure its greater power as a cyclic event, something that happened not once but happens every year in the depths of December and has a reality more profound that either the historic or the mythic.
In our embrace of Chronos, we have lost Kairos. We have substituted remembrance for recognition, and as a consequence have substituted mortality for eternity.

DISCTIME.WPD JUNE 16, 2001

A BRIEF HISTORY OF DISCRETIONARY TIME

In the animal kingdom the universal rule governing the allotment of time is the priority assigned to food. Animals and birds are required to devote almost full time to hunting or grazing; either in the search for or the in taking of energy. It may be an illusion, but mankind seems to have emancipated itself, at least to some extent, from this basic rule. We have acquired what we call 'discretionary time', time to do something besides searching for or consuming food To some extent we have used this discretionary time iteratively to acquire additional discretionary time. Indeed, civilization, culture, technology, science, have resulted from growth out of an initial seed of discretionary time, a seed that must have been sacrificially acquired.[1]

But now we arrive at a paradox: We have such an abundance of discretionary time that we are at a loss of what to do with it. Admittedly, some of our discretionary time is still reinvested in the acquisition of the kind of knowledge that secures additional discretionary time, eg. scientific research, developing new sources of energy, etc. but for the most part when we are not working for a living [update of hunting or grazing] we have the problem of what to do with our time. Several decades ago Dennis Gabor predicted that some of the main problems of the 20th century would be problems created by leisure time. However, we have come up with several "solutions". One, an ever expanding entertainment industry. This would include theater, cinema, TV, spectator sports, and perhaps politics. Second, an ever expanding recreation industry. This would include participatory sports, fitness programs, tourism, travel, cruises, resorts. Third, continuing education, adult education, seminars, retreats, etc. Fourth, busy work, doing more for less, reduction of discretionary time by having to work longer hours, doing additional record and book keeping, even the increasing time required to open the ubiquitous packages that everything is encased in, but most of all by the contortion of cycles. [2]

There have been two losses. The loss in the *amount* of discretionary time, and the loss in the *quality* of discretionary time. One measure of the quality of time is the length of *uninterrupted* time that is available for whatever project or activity is being engaged. But today, time, for whatever use, has been slashed, skewed, juggled, and patched, resulting in the loss of its 'utility per-minute'. This devaluation of time is manifested in our requiring more time to get the same things done. But more disastrously, only interruption free time of sufficient length allows us to penetrate to the full depths of a project. But there is a second measure of the quality of time. It is what the Greeks called **Kairos**, meaning the coordination of activity with the cycles of nature. There is a proper cosmic time for each human activity, poetically described in Ecclesiastes 3:1-8. But Kairos has been totally obliterated in the modern world.

---

[1] This view of the sprouting of discretionary time from a seedling of discretionary time contradicts the Genesis story of expulsion from the Garden of Eden, and the curse of mankind's having to live by the sweat of the brow. If ever, for some brief moment, we did inhabit such a garden, the evolution of discretionary time describes humanity's response to our expulsion.

[2] At one time invoices were submitted and paid on a monthly basis, usually coordinated with the first of the month. Now every company uses a different number of days in their billing cycle and the once universal 'first of the month' has disappeared. The result: paper work all month long.

FROM BIRDS3.WPD 2003 #19
Paul Tillich, a theologian and a deeply soulful man, described this process as Kairos: An outstanding moment in the temporal process, a moment in which the eternal breaks into the temporal — shaking, transforming it, creating a crisis at the depth of human existence.

FROM CHRISMED. 1993 # 54

II The Pagan Celebration: Relating the season to nature

- **Winter** The celebration of winter, the season of introversion and transformation. The stilled world listening to the silence of the winter stars. The scars of the earth covered with a white purifying blanket, the beauty of the earth enhanced by the fanciful masks of frost, ice, and snow. The paradox between the intimacy and otherness we feel with the crystalline world of ice and snow. And the paradox between the constraints and the empowerments it provides us. The exhilaration of the gliding world of sleighs, skis, and skates releasing us from the rotating repetitious world of wheels.

- **The Solstice** The season of darkness moves to its climax. And as in a theater when the lights grow dim, feelings of anticipation rise. Although the darkness depresses our spirits (SAD, Seasonal Affective Disorder), anticipations accompanying the turning offset it. The yule log is set ablaze and the warmth and light of the hearth sustain us through the tropos.

- **The 25th of December** Dies Natales Invicti: The Darkness is overcome, and the good news spreads that light will prevail. It is the birthday of the renewed sun. And in consequence the beginning of a new year. The victory is celebrated with trees of light, menorahs. But even so, this day is the most special day of the year. The sun reaches its maximum velocity to the east, opening the day to its greatest span. The time of maximum receptivity. Nature's time and man's time are in phase, chronos and kairos become one.

When these seasonal archetypes are merged with the aseasonal archetypes, adorned with the stories of the stable, the shepherds, and the star, a mystery of profound beauty is created., and the whole becomes far greater than the sum of the parts.

FROM TEMPDYAD 1994#12

```
Creativity must have two frames of reference.--Craik
Information must have a faster rate than matter.
Is Kairos associated with density time?  Both are cyclical.
Is Chronos associated with motion time?  Both are linear.
```

1995 #8

ZEROSUM1.WP6 NEW EPIINT January 28, 1995

THE WORLD OF TIME AND THE WORLD OF ~~LOVE~~ SPIRIT

If I take time for shopping, I have less time for lunch. If I spend time watching TV, I have less time for sleep. If I store furniture in the garage, I have less space for the shop. If I pave a patio, I have less space for the garden. Abundance here always creates scarcity there. It appears that both time and space have the properties of a "zero-sum-game". If A wins, then B loses. The world of matter and things is a highly competitive world, filled with the struggle for time, space, energy, and money.

On the other hand, if I love my oldest child, that enhances my ability to love my other children. The more love I give, the more I seem to have to give. And the more I give the more that is given back to me. Where there is beauty, more beauty is inspired and created. Abundance anywhere increases abundance elsewhere. Both Love and Beauty seem to have the properties of a "non-zero-sum-game". The more A has, the more B is able to have, and the more all can have. The world of the spirit functions so that to those who give, more is given and those who retain lose what they would keep.

This difference between zero-sum in the world of time and space and non-zero-sum in the world of love and beauty shows that spiritual quantities exist outside and beyond time and space, and are not subject to the same processes that govern the physical world. We conclude that while that which exists in time and space must follow the physical laws of growth and decay, that which exists outside time, may never decay nor die.

The fact that we experience one set of rules for material things, and another for spiritual things, implies humans possess two kinds of existence. Our physical component obeying the laws of the world of space and time, our non-physical component obeying the laws of the spirit.

A basic question arises: ~~From~~ Into the closed world of matter, with zero-sum space and time, how do we ~~enter~~ bring in the eternal non-zero-sum world of Love and Beauty?

Life & Love

I don't think the ~~material~~ material space-time world can contain what the Spirit would pour into it. It is too limited a ~~vessel~~ vess

1994 #27 b

No file

THIS IS

April 12, 1994 reformated January 6, 2002

See CHRNKROS.PS1 91#101 also 1994 #27

Chronos and Kairos

[redacted]re are two distinct aspects of time. A description of the first is given by Omar Khayyam in the Rubiayat:

The moving finger writes
and having writ moves on,
nor all your piety nor wit
can lure it back to cancel half a line.

A description of the second is given in the Bible, Ecclesiastes 3: 1-8:

For everything there is a season,
a time to every purpose under the heaven:
A time to be born, and a time to die;
a time to plant and a time to pluck what is planted.

The Greeks had a word for each type of time. CHRONOS (XPONOΣ), meaning a period, a space of time, a duration of time. This is linear time, the time measured by the clock, ever flowing forward, ticking away. Chronos stands for the quantity of time. And KAIROS (KAIPOΣ), meaning the right time for an action, the critical moment, the opportune season. This is cyclical time, the time that presents or denies opportunity. Kairos stands for the quality of time.

[redacted]Chronos is the time of physics. The aspect of time that can be measured. It is like the metronome of the musician, or like the odometer in our car, telling us how far we have gone. Kairos is the time of being, it has never been measured. It is the rhythm, melody and harmony of the musician, or the country side through which we travel. That there is kairos, a proper time to do certain things, means that time is not an isolated or independent entity, but is related to the events that occur in it. The same is true of space. Space is not an isolated or independent container, but is related to the objects which occupy it.

While kairos was of great importance to ancient Hebrews and Greeks, its experience today is obscured by technology, urbanization, and particularly by our modern worldview. In the age of science we are imprisoned by the idea that only that which is measurable is of significance. Since the only measurable aspect of time is duration, in our worldview time has come to be regarded as having only quantity, and to assert that there is also quality to time, i.e. kairos, is regarded as unscientific.

r '

[redacted]

1994# 27a

KAIROS1.W52 April 2, 1994

Eclesiastes 3:1-8 tells us that there is Kairos.

For everything there is a season,
a time to every purpose under the heaven:
A time to be born, and a time to die;
a time to plant and a time to pluck what is planted.

The Rubiayat of Omar Khayyam tells us that there is Chronos

The moving finger writes
and having writ moves on,
nor all your piety nor wit
can lure it back to cancel half a line.

That there is kairos, a proper time to do certain things, means that time is not an independent entity, but is related to all other things. That there are proper places for certain things in like manner says that space is not an independent frame, but is related to all things it contains.

There are many dyads in the nature of time: Kairos and Chronos, cyclical and linear time, objective and subjective time, peri and dia time, historical and primordial time, ... Some of these are the same slice, but in general there seem to be two aspects to time. Whether these can be considered as dimensions as with space is open to question.

The contents of space determines the nature of space, in particular the density of matter determines the curvature of space. So it is with time. The events determine the extension of time.

Then there is the matter of singular points, referred to by Clark Maxwell. These are special moments of time when causality and determinism is broken. THe moments for selecting the next archetype. Even in chaos theory there is the possibility of perturbed initial points leading to quite diverse attractors. When do these initial points occur? Certainly not every moment of time is the same.

Heschel reports that the Hebrews converted cyclical time into linear time by projecting historical events onto their calendar. Thus the beginning of spring, a cyclical event, becomes Passover, an historical event. Harvest, a cyclical seasonal event, becomes Succoth, an historical event. etc. The Christians followed this same practice projecting certain historical events, the Nativity, the Presentation, the Annunciation, the Resurrection, etc onto calendric seasonal times, converting the cyclical into the historical. Thus the liturgical calendar, though cyclical, is made historical and hence linear. This results in the destruction of Kairos, replacing it with Chronos. It is paradoxical that the kairotic statement of Eclesiastes 3:1-8 is rendered ineffective by the transference of cyclical to historical time. This practice has resulted in Christmas being an historical event, not an ever recurring event. Resurrection is historic, an event that took place 2000 years ago, rather than an event that occurs every year. The living vitality of Kairos is lost.

GATHKAIROS.WPD October 29, 2005

Kairos is an outstanding moment in the temporal process, a moment in which the eternal breaks into the temporal — shaking it, transforming it, and creating a crisis at the depth of human existence. –Paul Tillich

Both Kairos and Temenos are non-contiguous and non-continuous is space and time.

Chronos is time, Kairos is timing

There is mutuality in Kairos. God accepting us, we embracing God

Samhain, not when two worlds collide, but when two worlds intersect.

The monastic bells secularized the sacred, turned ritual into schedule and Kairos into Chronos

Presence in chronos is a top gun instant. Presence in Kairos is diachronic awareness and wakefulness.

Kairos is related to spontaneity

Astrology has roots in kairos

A temple : temenos :: a schedule : kairos

The liturgical year has drifted from kairos to schedule.

Halloween and Christmas are cultural attempts to recapture kairos.

Synchronic/Diachronic :: Schedule/Kairos

As we separate more from nature, we substitute schedule for Kairos.

1991 #101

CHRNKROS.p51 DISK:TIME September 12, 1991

CHRONOS AND KAIROS

In almost all religious traditions there is implicit the notion of the existence of two kinds of time. The Greeks denoted these two times by chronos and kairos. Chronos is clock time while kairos is the proper time for an action to take place. The Hebrews had the same notion as is expressed in Ecclesiastes 3:1-8. Their two times even led to two New Year days. One was the beginning of the year in spring, the first of Nisan, the other in the fall at Rosh ha Shanah, the birthday of the world. One time was cyclical and governed the days of the festivals, the other was an on going linear or historical time. The Mayans made the same division with one time governed by a short count, the kairos, governed by a different god each day, and the historical or linear long count, their chronos.

Even in science there are kairos and chronos. The time involved in an experiment rolling balls down an inclined plane is purely chronos. However, the time when to launch a space probe for a minimum energy orbit involves kairos.

In modern times (chronos) the phenomenon called by Rifkin the 'graying of the calendar' has been spreading. This is in essence the obliteration of kairos. In trying to do what we want when we want, we choose to live as much as possible by chronos alone. But we must remember that Chronos devours his offspring. Which is to say that in seeking to ignore kairos, we become enslaved to chronos.

The concept of a proper time for doing anything has implicit in it the existence of two or more times or frequencies. Only when one frequency bears a particular relation to the other (such as being an harmonic) may the time be said to be proper for a certain activity. Sometimes the two times, cyclical and historical, are combined in a sprial or a helix. However, a better way of thinking about the two times might be to consider historical time as the carrier frequency which is modulated by cyclical frequencies and only when the signal is maximum, say, will the time for an activity be proper.

Motion Time
Change Time
Density Time [long count?]

TEMPHUB.WPD June 8, 2008

THE TEMPLATE HUBBLE CONSTANT

BASIC VALUES: [$\log_{10}$ (cgs)]

NEWTON'S CONSTANT	G =	−7.175 295 619	[L^3/MT^2]
PLANCK'S CONSTANT	ħ =	−26.976 923 930	[ML^2/T]
VELOCITY OF LIGHT	c =	10.476 820 703	[L/T]
PLANCK MASS	$m_o = \sqrt{c\hbar/G}$ =	−4.662 403 804	[M]
PLANCK LENGTH	$l_o = \sqrt{G\hbar/c^3}$ =	−32.791 340 829	[L]
PLANCK TIME	$t_o = \sqrt{G\hbar/c^5}$ =	−43.268 161 532	[T]
PROTON MASS	m_p =	−23.776 602 304	[M]
ELECTRON RADIUS	r_e =	−12.550 068 214	[L]
ELECTRON FREQUENCY	t_e =	+23.026 888 917	[T]
PROTON MASS/ELECTRON MASS	μ =	3.263 908 788	[0]
FINE STRUCTURE CONSTANT	α =	−2.136 834 673	[0]
COULOMB/GRAVITY FORCE RATIO	S =	39.355 471 115	[0]

The basic numerical template is based on extrapolating the Planck level/baryon level ratios.

LEVEL	LENGTH centimeters	TIME seconds	VOLUME $cent^3$	MASS grams
Planck	−32.791 340	−43.268 161	−98.374020	−4.662 403
RATIO =	**20.241 272** $(\alpha\mu S)^{1/2}$	**20.241 272** $(\alpha\mu S)^{1/2}$	**60.723818** $(\alpha\mu S)^{3/2}$	**19.114199** $(S/\alpha\mu)^{1/2}$
Baryon	−12.550 068	−23.026889	−37.650204	−23.776602
Dark	?	?	?	14.451796
Stellar	7.691264	−2.785617	23.073614	33.565995 *
Universe	27.932536	17.455655 **	83.797432	52.680194

* The mass of the sun is approximately 33.299

** This value reduces to 9.0478 billion years, or a Hubble Age of 13.5717 billion years, which is equivalent to a Hubble Constant of H_o = 72.0617 km/sec/megaparsec. Observation of 800 cepheids in the Virgo Cluster give $H_o = 71 \pm 7$ km/sec/mpc. [1999]

NON-LOCALITY

H-SPACE TIME

FORM - a change in any part is instantaneously re-adjusted throughout. ∃ a certain kind of contiguity

Sound travels at different speeds in different substances

Each form has its own timerate of re-adjustment

cf. $rate = f(\rho)$

P-SPACETIME

Movement place to place time

Positive charge   Non-Contiguity

$\frac{L}{R}$ Dynamic Time $L \sim R$? $\frac{GM}{c^2}$

WAVE-TIME

C   Modulation ~ Form?

Communication Time

Non Continuity Time

Evolution of Form Time

≠

Coherence of Form Time

Preservation of an invariant

Gus Stromberg Effect

Arts Hoze

08 06 20

NUMBER [7]
SUBJECT [SPECIES OF REALITY, ONTIC DENSITIES]
TEXT [WE BEGIN WITH TWO GEOMETRIC OBJECTS:
1) A TORUS
2) A PROLATE SPHEROID
A TORUS SPINNING ABOUT A DIAMETER GENERATES TWO SPHERES. AN INNER SPHERE OF ZERO ONTIC DENSITY AND A SURROUNDING SPHERICAL SHELL WHOSE ONTIC DENSITY IS A FUNCTION OF THE RATE OF SPIN.
A PROLATE SPHEROID WHOSE TWO MINOR AXES ARE EQUAL SPINNING ABOUT ONE OF THOSE MINOR AXES WILL GENERATE AN OBLATE SPHEROID WHOSE CENTER IS A SPHERE OF ONTIC DENSITY ONE, AND WHOSE OUTER PORTION IS A RING WHOSE ONTIC DENSITY IS A FUNCTION OF THE RATE OF SPIN (spin rate a). IF THIS OBLATE SPHEROID SPINS ABOUT A DIAMETER (spin rate b)IT WILL GENERATE TWO SPHERES. AN INNER SPHERE OF ONTIC DENSITY ONE AND AN OUTER SPHERE WHOSE DENSITY IS SET BY A COMBINATION OF THE spin rates a and b.

WHAT IS SIGNIFICANT IS THE INTERACTION OF AN OBSERVER'S EPISTEMIC RATES WITH THE RATES UNDERLYING THE ONTIC DENSITIES OF THE OBSERVED OBJECTS.
]

THE NUMBERS

The organization around frequencies
The TIME TABLE T w M, L
Species near t_0, the Planck TIME
Say < 12
for $D, \bar{D}, R, B, \hat{B}, \mathbb{R}, U, \ldots$
Common values – resonance – communication

AUOGODRO
AGGREGATION LAWS
ATHROISMATICS size N
PULSING FRACTALS
SET THEORY
LAWS OF CHANGE
DIALECTICS

VIBRATION
PARAMETERS
FREQUENCY
TYPE OF TIME
MODE
PARTICLE B ☆ etc

The ONTOLOGICAL

THE FREQUENCY APPROACH(ES) TO ONTOLOGY
SPIN RATES
ONTIC SPECTRA
EPISTEMIC ZONES – PERCEPTION w REALITY ILLUSIONS
HUMAN EPISTEMIC FREQUENCY LIMITS
EXTENSIONS
BY INSTRUMENTS, DRUGS
MEDITATION

STOPPING THE FAN
SCHRODINGER'S CAT
LI KIANG'S CAT
ONTIC DENSITIES
PERCEPTIONS w REALITY

PHENOMENA THE EXPERIENCED
UN ''
NOUMENA
THE EXPERIENCABLE
UN ''

NUMBER [6]
SUBJECT [THE ONTIC SPECTRUM]
TEXT [ANALAGOUS TO THE ELECTRO MAGNETIC SPECTRUM WITH ITS SUB RANGE OF VISIBLE WAVELENGTHS, IS AN ONTIC SPECTRUM WITH ITS SUB RANGE OF EPISTEMIC WAVELENGTHS. WHICH IS TO SAY THAT THE PORTION OF REALITY WE EXPERIENCE IS TO TOTAL REALITY, AS WHAT IS VISIBLE TO US IS TO ALL EM FREQUENCIES.

AT THIS POINT WE CANNOT SAY WHAT IS VIBRATING IN THE ONTIC SPECTRUM, BUT WE CAN BEGIN TO DETERMINE SOME OF THE BASIC FREQUENCIES OF THE EPISTEMIC ZONE.
]

AGERATE.WP6 September 8, 1995 also 1994 #54

HOW TO BE OLDER THAN YOUR MOTHER

You cannot be older than your mother, common sense apodictically asserts. But we are finding stars that are older than mother universe herself. Recent more refined measurements of the rate of expansion of the universe lead to an age of from nine to twelve billion years, while old stars in certain globular clusters require something like 16 billion years to explain their life span. The difference between the genealogical case and the cosmogonic case is that ages of mother and offspring are measured by the same clock while the ages of stars and the universe are measured by different clocks. The star-universe paradox may be easily dissolved if we can show the clocks run at different rates.

Games with time, clocks, and clock rates have been popular since Einstein brought out his special theory of relativity in 1905. There is, for example, the famous twin paradox of one twin staying on earth, the other twin taking a high speed space voyage of a few years duration and returning to earth to find his twin had died of old age decades ago. Relative clock rates in special relativity depend on relative velocities. So herein might lie a contribution to the star-universe paradox. But there are other clock games. For example, there are these fascinating objects called **black holes**. According to Einstein's general theory of relativity clocks behave differently in the presence of matter than in empty space. And in the presence of highly condensed matter such as occurs in a black hole the clock rate almost drops to zero. Herein might lie another contribution to the star-universe age paradox.

Proper Time?

Relativity theory tells us it is wrong to assume that the clock governing the rates of physical phenomena runs everywhere at the same rate. Furthermore the rate may be changing, as for example with a change of local or global density. Considering the variations in matter density throughout space and the change of density occurring in the general expansion itself, it is indeed probable that our present numbers assigned to ages of objects ranging from stars to the observable universe may require some adjustments. The problem of age shifts from determinations based on the hypothesis of a universal "metaclock" governing the entire universe and its contents to reconciling the rates of a set of diverse clocks operating at local rates throughout the universe. The concept of proper time—the time of the meta-clock is like Newton's absolute space & time.

Cosmology is based on what is called "proper" time

like Newton's absolute space

8TIMES.WPD February 19, 2000

FUNDAMENTAL TIMES

Dimensional considerations lead to the discrimination of ten basic times or frequencies. These are:

1) $t = R/c$
This time is based on motion and change. It involves a linear dimension, R, or distance. It is also radar time. It is the basis of Aristotle's concept of time, so **Aristotle** time.

2) $\tau = \sqrt{(R^3/GM)} = (G\rho)^{-1/2}$
This time is based on density. It involves both a mass, M, and a volume, R^3. This equation is Kepler's third law, so we term it **Kepler** time.

3) $T = GM/c^3 = Mc^2/(c^5/G)$
This time involves only mass, M.. It is equivalent to energy/power. The Energy is Einstein's energy, Mc^2, appropriately, let us call this **Einstein** time.

4) $Z = \hbar/Mc^2$
This time derives from Heisenberg's relation, energy x time = action or $\hbar$ The energy used is Mc^2. We might term this **Heisenberg** time.

5) $\zeta = \hbar R/GM^2$
This time also derives from the Heisenberg relation with the energy being gravitational. In honor of the father of gravity, this might appropriately be called **Newton** time.

6) $\Phi = \sqrt{(MR^3\alpha/e^2)} = \sqrt{(MR^3/\hbar c)}$
This time involves electric charge, as well as mass and volume. Perhaps it could be called **Coulomb** time.

7) $\phi = MR^2/\hbar$
This time also derives from the quantum relations. So to leave no one out, call this **Schrodinger** time.

8) $K = G^2M^2/Rc^5 = GM/c^2R \times T$
This time is also energy/power, gravitational energy this time. Since GM/c^2R defines the Schwarzschild limit, let's call this **Schwarzschild** time

9) $k = G\hbar/Rc^4$
This time derives from the fundamental constants, let's call it **Bohr** time.

10) $t_o = (G\hbar/c^5)$
This is the time associated with the Planck particle. It is the **Planck** time.

When the Planck mass and the Planck time are substituted in the above equations, their value in each case is the same = the planck time = -43.268366 sec

RETURN TO TIME

Time is a subject to which I repeatedly return over the years. I feel that culturally we have swept much undifferentiated experience of change under the single rug we call time. We have reduced all species of change to one kind of change–the change of position, i.e. the change produced by motion. And our concept of time is derived from particular properties of motion. This motion type of time, called Chronos by the Greeks, has become the exclusive time of Western culture, the time of Aristotle, Newton, Minkowski, and Einstein. While it had its beginnings in Greek thought, it also had rivals. Before a cultural consensus was achieved, there were heady disputes about the nature of time such as those between Herakleidos and Parmenides. And there were persistent dissidents like Zeno who speculated on alternative relations between events and change. The refusal of the Greek dissidents to grant exclusiveness to Chronos was based on their reverence for another kind of time they called Kairos. While chronos was purely quantitative, kairos preserved the qualitative dimensions of time. Another ancient culture, the Hebrew, also made this distinction, that between historical time (chronos) and qualitative time (kairos), described in Ecclesiastes 3:1-8.[1]

A residue of the difference between chronos and kairos is found today in the difference between linear time and cyclical time. Linear time consists of the counting of the ticks of the clock or the number of days, years, centuries, ... ,eons. But what is being counted? In each case some cycle, some return to a previous place. This leads to the notion of cycles within cycles within cycles [or wheels within wheels with wheels...] as being closer to what is being measured by clocks, calendars, Carbon 14, isotope ratios, Hubble parameter, etc. than something that is purely linear. Kairos maintains that quality emerges from the superposition of the cycles. When certain cogs on a wheel return to meet with specified cogs on another wheel the quality of the moment is affected–a resonance effect. But the Mayans saw this more clearly than the Greeks. They created specific wheels corresponding to cycles of different length that allowed them both chronos [long count] and kairos [short count].

But our experience of change other than that caused by motion–such as, growth, decay, mutation, evolution, etc.[2] may involve more parameters than either the Greeks or the Mayans perceived, and go beyond both the linear and the cyclical. For example, non-localization in quantum mechanics disputes the velocity ≤ c time inferred limitation on information exchange, allowing instant transfer over any distance. If the distance factor is removed from velocity, then all of our traditional motion derived time becomes but a special case.

---

[1] The Jews have two new years days, the first of Nisan, the first month, and Rosh ha-Shanah. These speak to the existence of two kinds of time. Rosh ha-Shanah is a celebration of the beginning of time, a linear time, while the yearly cycle begins with Nisan and springtime.

[2] Of course, all of these changes may be attributable to different kinds of motion, hence to special cycles contained within traditional time.

MARCH 28, 2000
[January 18, 1999 @ 6704]

TIME AND REALITY

Samhain, in today's calendar, November 4th, when the passage between realities is most facile, when the sun is at its western most solstice, when the solar motion is purely southward. The time when beings from other realities come into our reality and we may go to theirs.

I have had many brief glimpses of these visitors who come here, [or was it I who visited them?]. But always they are motionless as though the clock in their reality beat much more slowly than the clock in ours.

The entire matter of alternate realities seems to involve aspects of time. However, time as we understand it is but a part of one dimension of a structure that is a complexity of many dimensions. Our understanding is that of a linear creature's understanding of three dimensional space. [Not even so good as a flatlanders understanding of three space.]

Let us speculate. One hypothesis is that there are many parallel realities, each operating at a different frequency, but all superimposed in the same 3-dimensional space. [This is like the communication engineer's FDMA, Frequency Division Multiple Access .] For example we share the same world with mountains that march to the drummer who beats the tempo in eons, with fruit flies whose life time is a matter of hours, and with clouds whose activities are measured in minutes. And of course we not only share, but are one with, the micro world of atoms and particles the hands of whose clocks move in nano and pico seconds. Why are we fascinated with artifacts like lava lamps whose blobs evolve at a rate that is so unusual for the rates of our reality. Why are we fascinated with speed: Mach 2 jets, Racing cars, skiing down slopes? Is it because these give us a hint of the presence of other realities somehow related to ours through a difference of clock rate or frequency? And at the other pole, there are the mystics, who by meditation slow the clock, entering alternate realities that emerge from stillness and silence.

Can we fabricate a model of time that will fit all of these marginal glimpses of other realities, the thrills of speed, the psychic insights of stillness, the passages at Samhain? Can we visualize the Reality of which all realities are but facets? It has been said that an ontology [i.e. a description or model of a reality] depends on an epistemology [i.e. a methodology or way of knowing]. An epistemology is a humanly fabricated tool, helping us to know and explain, to feel and understand our experience. It is at once a window and a mirror, an opening through which we view the world and yet can see in it a reflection of our capabilities and our limitations. What we see through the epistemological window leads us to an ontology, a description of that which we are a part. What we see in the epistemological mirror is the nature of our own psychology and culture.

2times3.w52 disk January 29, 1994

MORE ON THE DYADIC NATURE OF TIME

In considering the elliptical orbit of a binary system in terms of system density, the mass is given by the sum of the masses of the two bodies and the R used to determine the volume is the semi-major axis, which is

$$(R_{min} + R_{max})/2$$

The density so calculated gives the correct answer for the values of the period when used in Kepler's third law. ~~Although~~ the density in an elliptical orbit is a function of time, it is continuously varying, so the period is determined by the mean value of the density. ~~So~~ the correct interpretation of the equation would be

$$\tau = \frac{K}{\sqrt{\bar{\varrho}}}$$

where $\bar{\varrho}$ is the mean density.

In the case of a system of three bodies, how would the mean density be calculated? This question leads to the heart of the difficulties involved in solving the general three body problem. There is no such thing as a mean density in this case and the system is aperiodic. In the restricted problem of three bodies, such as the sun, earth, moon configuration, calculation of a mean value of R should be possible ~~and~~ since the system is periodic.

~~One speculative~~ possible and imaginative way of calculating the density would be to pass a circle through the three bodies and take the radius of the circle as the value of R. Here the smallest R would be a value close to the astronomical unit, while the largest R would be almost infinite when the three bodies were near alignment, as ~~in the case of~~ during an eclipse. Returning to the earlier interpretation of the equation, that τ is a function of t, continuously varying, then the period would become exceedingly long as the density drops toward zero ~~at the time~~ during of an eclipse. Perhaps this $\tau \to \infty$ during an eclipse participates in giving an eclipse its awesomeness.

The feeling of eternity

Use a sphere for 4 bodies

for $n > 4$, what? Best to use bounding spheres

One method of calculation for $\tau = \frac{K}{\sqrt{\bar{\rho}}}$

another for $\tau(t) = \frac{K}{\sqrt{\rho(t)}}$

measure in seconds, minutes, ... years. Durations shorter that 1/8 of a second we invert and respond to as frequency and measure in hertz, kiloherz, megahertz, ... This seems to be the human time-frequency interface. It would be wrong to assume that other creatures and systems possess the same one.

If we take the positive axis of real numbers as a metaphor, then in the interval 1 to ∞ we express a number as n, its period or duration; in the interval 0 to 1 we express a number as 1/n, its frequency. In the metaphor the number 1 is the time-frequency interface.

We are left with the question, should we write A or B? where

check and re-do this

$$A) \quad \tau \stackrel{?}{=} \frac{k}{\sqrt{\bar{\rho}(t)}} \quad ; \quad B) \quad \tau(t) \stackrel{?}{=} \frac{k}{\sqrt{\rho(t)}}$$

Writing A infers that τ, though constant in length, is in some way a function of t, that it varies from instant to instant. Since it is not the length of the cycle that varies, it is something else. Perhaps it could be a "quality" of time, a large ρ indicating one quality, a small ρ another, but with the mean value of ρ determining the length of τ.
We might then write

$$q(t) = \frac{k}{\sqrt{\rho(t)}}$$

where q(t) is a quality.

91-#6 85

Ref: 91-#5, 91-#18, 93-#6, 93-#38, 93-#42, 94-#5, 94-#6, 94-#7, 94-#10, 94-#11, 94-#12, 97-#3 on music

a typo is here with regard to ρ and $\bar{\rho}$

A) $\tau = \frac{k}{\sqrt{\bar{\rho}(t)}}$

TIME TABLE: T=T(G,M,R,ħ,c)

[T] = 1

M	0	0.5	+1	1.5	+2	+2.5	+3
+3	G^2M^3/hc^4		$\sqrt{G^3M^6R^2/h^3c^5}$		GM^3R^2/h^2c		$\sqrt{GM^6R^6c/h^5}$
+2.5		$\sqrt{G^3M^5R/h^2c^6}$		$\sqrt{G^2M^5R^3/h^3c^3}$		$\sqrt{GM^5R^5/h^4}$	
+2	$\sqrt{G^3M^4/hc^7}$		GM^2R/hc^2		$\sqrt{GM^4R^4/h^3c}$		M^2R^3c/h^2
+1.5		$\sqrt{G^2M^3R/hc^5}$		$\sqrt{GM^3R^3/h^2c^2}$		$\sqrt{M^3R^5c/h^3}$	
+1	GM/c^3		$\sqrt{GM^2R^2/hc^3}$		MR^2/h		$\sqrt{M^2R^6c^3/Gh^3}$
+1/2		$\sqrt{GMR/c^4}$		$\sqrt{MR^3/hc}$		$\sqrt{MR^5c^2/Gh^2}$	
0	$\sqrt{Gh/c^5}$		R/c		$\sqrt{R^4c/Gh}$		R^3c^2/Gh
-1/2		$\sqrt{Rh/Mc^3}$		$\sqrt{R^3/GM}$		$\sqrt{R^5c^3/G^2Mh}$	
-1	h/Mc^2		$\sqrt{R^2h/GM^2c}$		R^2c/GM		$\sqrt{R^6c^5/G^3M^2h}$
-3/2		$\sqrt{Rh^2/GM^3c^2}$		$\sqrt{R^3hc/G^2M^3}$		$\sqrt{R^5c^4/G^3M^3}$	
-2	$\sqrt{h^3/GM^4c^3}$		Rh/GM^2		$\sqrt{R^4hc^3/G^3M^4}$		R^3c^3/G^2M^2
-5/2		$\sqrt{Rh^3/G^2M^5c}$		$\sqrt{R^3h^2c^2/G^3M^5}$		$\sqrt{R^5hc^5/G^4M^5}$	
-3	h^2/GM^3c		$\sqrt{R^2h^3c/G^3M^6}$		R^2hc^2/G^2M^3		$\sqrt{R^6hc^7/G^5M^6}$

Notation: In the above table h is used for ħ, the Planck constant / 2π .

TIME TABLE: T=T(G,M,R,ħ,c)

[T] = 1

M	0	0.5	+1	1.5	+2	+2.5	+3
+3	G^2M^3/hc^4		$\sqrt{G^3M^6R^2/h^3c^5}$		GM^3R^2/h^2c		$\sqrt{GM^6R^6c/h^5}$
+2.5		$\sqrt{G^3M^5R/h^2c^6}$		$\sqrt{G^2M^5R^3/h^3c^3}$		$\sqrt{GM^5R^5/h^4}$	
+2	$\sqrt{G^3M^4/hc^7}$		GM^2R/hc^2		$\sqrt{GM^4R^4/h^3c}$		M^2R^3c/h^2
+1.5		$\sqrt{G^2M^3R/hc^5}$		$\sqrt{GM^3R^3/h^2c^2}$		$\sqrt{M^3R^5c/h^3}$	
+1	GM/c^3		$\sqrt{GM^2R^2/hc^3}$		MR^2/h		$\sqrt{M^2R^6c^3/Gh^3}$
+1/2		$\sqrt{GMR/c^4}$		$\sqrt{MR^3/hc}$		$\sqrt{MR^5c^2/Gh^2}$	
0	$\sqrt{Gh/c^5}$		R/c		$\sqrt{R^4c/Gh}$		R^3c^2/Gh
-1/2		$\sqrt{Rh/Mc^3}$		$\sqrt{R^3/GM}$		$\sqrt{R^5c^3/G^2Mh}$	
-1	h/Mc^2		$\sqrt{R^2h/GM^2c}$		R^2c/GM		$\sqrt{R^6c^5/G^3M^2h}$
-3/2		$\sqrt{Rh^2/GM^3c^2}$		$\sqrt{R^3hc/G^2M^3}$		$\sqrt{R^5c^4/G^3M^3}$	
-2	$\sqrt{h^3/GM^4c^3}$		Rh/GM^2		$\sqrt{R^4hc^3/G^3M^4}$		R^3c^3/G^2M^2
-5/2		$\sqrt{Rh^3/G^2M^5c}$		$\sqrt{R^3h^2c^2/G^3M^5}$		$\sqrt{R^5hc^5/G^4M^5}$	
-3	h^2/GM^3c		$\sqrt{R^2h^3c/G^3M^6}$		R^2hc^2/G^2M^3		$\sqrt{R^6hc^7/G^5M^6}$

Notation: In the above table h is used for ħ, the Planck constant / 2π .

TIME TABLE: T=T(G,M,R,ħ,c)

[T] = 1

M	-3	-2.5	-2	-1.5	-1	-0.5	0
+3	$\sqrt{G^7M^6h/R^6c^{17}}$		G^3M^3/R^2c^7		$\sqrt{G^5M^6/R^2hc^{11}}$		G^2M^3/hc^4
+2.5		$\sqrt{G^6M^5h/R^5c^{15}}$		$\sqrt{G^5M^5/R^3c^{12}}$		$\sqrt{G^4M^5/Rhc^9}$	
+2	G^3M^2h/R^3c^8		$\sqrt{G^5M^4h/R^4c^{13}}$		G^2M^2/Rc^5		$\sqrt{G^3M^4/hc^7}$
+1.5		$\sqrt{G^5M^3h^2/R^5c^{14}}$		$\sqrt{G^4M^3h/R^3c^{11}}$		$\sqrt{G^3M^3/Rc^8}$	
+1	$\sqrt{G^5M^2h^3/R^6c^{15}}$		G^2Mh/R^2c^6		$\sqrt{G^3M^2h/R^2c^9}$		GM/c^3
+1/2		$\sqrt{G^4Mh^3/R^5c^{13}}$		$\sqrt{G^3Mh^2/R^3c^{10}}$		$\sqrt{G^2Mh/Rc^7}$	
0	G^2h^2/R^3c^7		$\sqrt{G^3h^3/R^4c^{11}}$		Gh/Rc^4		$\sqrt{Gh/c^5}$
-1/2		$\sqrt{G^3h^4/MR^5c^{12}}$		$\sqrt{G^2h^3/MR^3c^9}$		$\sqrt{Gh^2/MRc^6}$	
-1	$\sqrt{G^3h^5/M^2R^6c^{13}}$		Gh^2/MR^2c^5		$\sqrt{Gh^3/M^2R^2c^7}$		h/Mc^2
-3/2		$\sqrt{G^2h^5/M^3R^5c^{11}}$		$\sqrt{Gh^4/M^3R^3c^8}$		$\sqrt{h^3/M^3Rc^5}$	
-2	$Gh^3/M^2R^3c^6$		$\sqrt{Gh^5/M^4R^4c^9}$		h^2/M^2Rc^3		$\sqrt{h^3/GM^4c^3}$
-5/2		$\sqrt{Gh^6/M^5R^5c^{10}}$		$\sqrt{h^5/M^5R^3c^7}$		$\sqrt{h^4/GM^5Rc^4}$	
-3	$\sqrt{Gh^7/M^6R^6c^{11}}$		$h^3/M^3R^2c^4$		$\sqrt{h^5/GM^6R^2c^5}$		h^2/GM^3c

Notation: In the above table h is used for ħ, the Planck constant / 2π .

TIME TABLE: T=T(G,M,R,ħ,c)

[T] = 1

M	-3	-2.5	-2	-1.5	-1	-0.5	0
+3	$\sqrt{G^7M^6h/R^6c^{17}}$		G^3M^3/R^2c^7		$\sqrt{G^5M^6/R^2hc^{11}}$		G^2M^3/hc^4
+2.5		$\sqrt{G^6M^5h/R^5c^{15}}$		$\sqrt{G^5M^5/R^3c^{12}}$		$\sqrt{G^4M^5/Rhc^9}$	
+2	G^3M^2h/R^3c^8		$\sqrt{G^5M^4h/R^4c^{13}}$		G^2M^2/Rc^5		$\sqrt{G^3M^4/hc^7}$
+1.5		$\sqrt{G^5M^3h^2/R^5c^{14}}$		$\sqrt{G^4M^3h/R^3c^{11}}$		$\sqrt{G^3M^3/Rc^8}$	
+1	$\sqrt{G^5M^2h^3/R^6c^{15}}$		G^2Mh/R^2c^6		$\sqrt{G^3M^2h/R^2c^9}$		GM/c^3
+1/2		$\sqrt{G^4Mh^3/R^5c^{13}}$		$\sqrt{G^3Mh^2/R^3c^{10}}$		$\sqrt{G^2Mh/Rc^7}$	
0	G^2h^2/R^3c^7		$\sqrt{G^3h^3/R^4c^{11}}$		Gh/Rc^4		$\sqrt{Gh/c^5}$
-1/2		$\sqrt{G^3h^4/MR^5c^{12}}$		$\sqrt{G^2h^3/MR^3c^9}$		$\sqrt{Gh^2/MRc^6}$	
-1	$\sqrt{G^3h^5/M^2R^6c^{13}}$		Gh^2/MR^2c^5		$\sqrt{Gh^3/M^2R^2c^7}$		h/Mc^2
-3/2		$\sqrt{G^2h^5/M^3R^5c^{11}}$		$\sqrt{Gh^4/M^3R^3c^8}$		$\sqrt{h^3/M^3Rc^5}$	
-2	$Gh^3/M^2R^3c^6$		$\sqrt{Gh^5/M^4R^4c^9}$		h^2/M^2Rc^3		$\sqrt{h^3/GM^4c^3}$
-5/2		$\sqrt{Gh^6/M^5R^5c^{10}}$		$\sqrt{h^5/M^5R^3c^7}$		$\sqrt{h^4/GM^5Rc^4}$	
-3	$\sqrt{Gh^7/M^6R^6c^{11}}$		$h^3/M^3R^2c^4$		$\sqrt{h^5/GM^6R^2c^5}$		h^2/GM^3c

Notation: In the above table h is used for ħ, the Planck constant / 2π .

2TIMES2.W52 DISK: January 28, 1994

THE TWO-FOLD NATURE OF TIME

I am repeatedly bothered by questions such as the one posed by the nature of "density" time. It is well known that the period in many systems varies inversely with the square root of the density.

$$(1) \qquad \tau = k/\sqrt{\varrho}$$

In such systems as a pulsating star whose density varies with the period τ, what is the value of ϱ that determines the period? Another example is given by Kepler's Second Law. In an elliptical orbit, the mean density of a binary system varies with the separation of the two objects. If the period depends on the density, and the density on the separation, which density and which separation? For purposes of Kepler's Third Law, of which equation (1) is a special form, we can calibrate the periods against a specific separation or density. In the case of binaries, the semi-major axis is usually chosen. While we can answer the question of what density to choose by calibration, we have not resolved the paradox implied by equation (1) that since ϱ is different at each instant of time, τ must also be different at each instant, yet we end up with a single value for τ. Are we talking about two kinds or levels of time when we refer to $\tau(t)$, the period being a function of time? Should not equation (1) be written

$$(2) \quad \tau(t) = k/\sqrt{\varrho(t)}$$

and just what is the physical and cognitive difference between τ and t? Are we talking about the same kind of time in Kepler's Second and Third Laws?

But this is not the only instance in which we encounter a dyadic nature in time. Every physical system, in order to maintain coherence, must have a fast component and a slow component. We recognize this in artificial systems. In the 19th century, railroad operation came to depend on the telegraph, the slow trains and fast wire signals. In the 20th century we see the far more complex airline systems as totally dependent on radio communication, the slow airplanes and the fast wireless signals. And in organic systems, the nervous system operates at high speed relative to the muscular system. Throughout the universe information must move more rapidly than matter. There are fast clocks (zeitgebers) and slow clocks and both are required to tell us "what time it is".

In the 30's and 40's

The Mount Wilson astronomer, Gus Stromberg, used ~~to like~~ to point out a paradox that everybody chose to ignore. The beam interferometer mounted on the front of the 100 inch telescope allowed the diameters of near by stars to be measured. The process depended on light originating at the left limb of the star forming an interference pattern with light originating at the right limb. But Stromberg pointed out that for such an interference pattern to be possible, the atoms at the left end and those at the right end must radiate in coherence. That is, they must stay in phase, operate under the baton of the same orchestra director. But the diameter of the star was too great for the velocity of light to serve as director. So how did the atoms know what time it was? What was the fast information system that made interference patterns possible? Some second level kind of time involved?

We have long recognized that time derives from change. Aristotle, and Western scientists ever since, have centered on the particular kind of change we call motion.

time = distance/velocity

But in equation (1) we are encountering time that does not involve motion or even change. Time is a attribute of matter, in particular of the density of matter. But this is exactly what the general theory of relativity tells us. Both space and time are attributes of matter. With no matter present, there would be neither space nor time. Since frequency is the inverse of period, equation (1) tells us that frequency is proportional to the square root of density. If the density is zero, the frequency becomes zero (the period, infinite), and if the density is high the frequency becomes high (is there an upper bound?).

The two ways of looking at time, as period or as frequency, constitute another dyadic aspect of time. Here music comes to mind. Music consists of a series of events, call them notes, each with a period or duration and each with a pitch or frequency. Music is usually represented by a two dimensional device called a staff, on which the horizontal axis represents rhythm and the vertical axis represents pitch. The interesting question is where is the interface between time rates we term rhythm and those we term pitch? Pitch usually is the realm of the ear, going as low as say 30 hertz. Rhythm is the realm of feeling, going as fast as say 8 hertz. So somewhere in the neighborhood of a tenth of a second, we make a switch between period and frequency, between rhythm and pitch. It is interesting that the lepton zeitgeber (see The Zeitgebers, Scraps 93 #38) has a period of 0.120537 seconds corresponding to a frequency of 8.296 hertz. Perhaps this is the interface. Durations longer than 1/8 second we respond to as duration and

measure in seconds, minutes, ... years. Durations shorter that 1/8 of a second we invert and respond to as frequency and measure in hertz, kiloherz, megahertz, ... This seems to be the human time-frequency interface. It would be wrong to assume that other creatures and systems possess the same one.

If we take the positive axis of real numbers as a metaphor, then in the interval 1 to ∞ we express a number as n, its period or duration; in the interval 0 to 1 we express a number as 1/n, its frequency. In the metaphor the number 1 is the time-frequency interface.

We are left with the question, should we write A or B? where

check and re-do this

$$A) \quad \tau \stackrel{?}{=} \frac{k}{\sqrt{\bar{\rho}(t)}} \quad ; \quad B) \quad \tau(t) \stackrel{?}{=} \frac{k}{\sqrt{\rho(t)}}$$

Writing A infers that τ, though constant in length, is in some way a function of t, that it varies from instant to instant. Since it is not the length of the cycle that varies, it is something else. Perhaps it could be a "quality" of time, a large ρ indicating one quality, a small ρ another, but with the mean value of ρ determining the length of τ.
We might then write

$$q(t) = \frac{k}{\sqrt{\rho(t)}}$$

where q(t) is a quality.

91-#6 88

Ref: 91-#5, 91-#18, 93-#6, 93-#38, 93-#42, 94-#5, 94-#6, 94-#7, 94-#10, 94-#11, 94-#12, 97-#3 on music

a typo here with regard to ρ and $\bar{\rho}$

A) $\tau = \frac{k}{\sqrt{\bar{\rho}(t)}}$

2times3.w52 disk January 29, 1994

MORE ON THE DYADIC NATURE OF TIME

In considering the elliptical orbit of a binary system in terms of system density, the mass is given by the sum of the masses of the two bodies and the R used to determine the volume is the semi-major axis, which is

$$(R_{min} + R_{max})/2$$

The density so calculated gives the correct answer for the values of the period when used in Kepler's third law. Although the density in an elliptical orbit is a function of time, it is continuously varying, so the period is determined by the mean value of the density. So the correct interpretation of the equation would be

$$\tau = \frac{K}{\sqrt{\bar{\varrho}}}$$

where $\bar{\varrho}$ is the mean density.

In the case of a system of three bodies, how would the mean density be calculated? This question leads to the heart of the difficulties involved in solving the general three body problem. There is no such thing as a mean density in this case and the system is aperiodic. In the restricted problem of three bodies, such as the sun, earth, moon configuration, calculation of a mean value of R should be possible and the system is periodic.

One speculative way of calculating the density would be to pass a circle through the three bodies and take the radius of the circle as the value of R. Here the smallest R would be a value close to the astronomical unit, while the largest R would be almost infinite when the three bodies were near alignment, as in the case of an eclipse. Returning to the earlier interpretation of the equation, that τ is a function of t, continuously varying, then the period would become exceedingly long as the density drops toward zero at the time of an eclipse. Perhaps this $\tau \to \infty$ during an eclipse participates in giving an eclipse its awesomeness.

The feeling of eternity

Use a sphere for 4 bodies

for $n > 4$, what?

Best to use bounding spheres

One method of calculation for $\tau = \frac{K}{\sqrt{\bar{\rho}}}$

another for $\tau(t) = \frac{K}{\sqrt{\rho(t)}}$

TIMEDRV1.WPD FEBRUARY 8, 2001

TIME AND LOGIC

Aristotle's law of the excluded middle [see Scraps 1999#54, 2000#69] in effect has instituted a way of thinking that precludes our seeing the world as it really is. His logic derives from basic human experience of the world portrayed to us by our senses, but not reflecting the many other facets that the world possesses. For example, in our sensory experience of the world two objects cannot occupy the same place at the same time, nor can a single object be two different places at the same time. These indisputable "facts" are at the root of Aristotle's logic, and are the basics underlying true-false polarization and the law of the excluded middle. For over two thousand years this two valued logic has not been questioned, but now...

But now comes Schrödinger's Cat, who defies polarization, and confounds our thinking about him in Aristotelean terms. The cat is not governed by the polarization canon of the excluded middle which says he must be either dead or alive. It is absolutely non-Aristotelean to have a cat who is *both* dead and alive or possibly *neither* dead nor alive. Quantum mechanics forces us to admit that the world as we have always thought it to be is but a special case of a larger cosmic reality, and our way of thinking is but an adaptation to [or creation of] that special case.

Let us introduce another cat. This cat belongs to the Chinese sage, Li Kiang. Li's cat is one of those who, if inside, wants out; if outside, wants in. And except for the minor periods of transit, at any one time the cat is either inside or outside. No confusion about that. But Li nevertheless sometimes becomes confused, for Li is one of those sages who is able to speed or slow the rate at which his sensory clock tics, that is, the rate at which subjective time flows. One of the meditations that Li practices enables him to halt the movement of the secondhand of a clock. [If the clock had a microsecond hand Li could also halt its movement, a nanosecond hand? Perhaps]. When in such a meditative state, Li does not have to worry about the cat. It is permanently either inside or outside, as motionless in its position as the everlasting hills. Thus, when Li uses this meditation, the apparent glacial rate-of-flow of external time transfers him to a Parmenidean world.

But Li is also able by slowing his subjective clock to speed the apparent rate-of-flow of external time, and this is where his confusion begins. [But not only is Li confused, but those who know and watch Li are confused. He can remain absolutely motionless for days at a time.] What Li observes during his slowed time meditations is that everything about him moves very rapidly. For Li, the cat is simultaneously *both* inside and outside, because an "instant" of time for Li spans many transitions by the cat. But when Li goes to the extreme and stops his subjective clock, then everything moves so rapidly that it vanishes from his perception, and Li's cat, like its cousin the Cheshire Cat, disappears. The cat is then *neither* inside nor outside.

We conclude: There is a different logic proper to different ratios of subjective rate of time flow to external rate of time flow. Logics employing the law of the excluded middle are proper with "normal" rate ratios, but lead to erroneous conclusions when observing a world with a widely different ratio, such as the micro world of quantum mechanics or the universe itself.

TIMEMEAS.WPS August 18, 2005

MEASURING TIME

The operational definition of time:
"Time is what is measured by a clock" –P. W. Bridgman

Humans have been measuring time for millennia, but still are not sure just what it is they are measuring. And if Professor Bridgman's definition of time is correct, then we might ask, if we measure time by an hour glass, by a water clock, or by monastery bells, are we measuring the same thing that a mechanical clock measures? It may be that while all devices measure the same essence, each different device measures some different aspect, attribute, or component of time. Whether this is so, different measuring devices do emphasize and project different "feelings" about the nature of time.

The oldest measuring device of time was the sky, the cyclical positions of the sun, giving us the day and the year; the positions and phases of the moon, giving us the month. Wherever we went, the same sun was there, regularly repeating its voyage through the sky. This emphasized the feeling that time must be the same everywhere, time was universal and absolute. And these ancient inferences from the sky of a single fundamental and universal time still dominate our present day view of time. But also implicit in the sky clock was the cyclical nature of time. Time was made of ever repeating cycles.

In time the ancients developed devices with finer temporal resolving power than those afforded by the motions of the sun and moon. Water clocks and sand clocks (hour glasses) were devised that could measure a fixed interval of time depending on the amount of water or sand transferred from an upper container to a lower container. While these measuring devices could be rendered cyclical, as by regularly refilling the water chamber or inverting the hour glass, this required the intervention of an outside agent. But without the intervention of some outside agent, the period came to an end. This had inferences that were projected into ancient religious thought: Time comes to an end. There will be an end to the present order and then some deity will come to renew the world. There will be a new Brahma, and a new life time of Brahma, A messiah will come, A savior will return and there will be a day of judgement.

In the middle ages arrived another measuring device for time: the monastery bells telling us when to rise, when to pray, to eat, to work, to return, to pray and to sleep. The bells told us that different times were appropriate for different tasks. This has evolved to our present day structuring of time with schedules, our nine to five and 7/24.

In the 14th century, mechanical clocks began to appear on towers in different cities. These clocks not only changed civil life, they changed the world view. The cyclical movement of the hands of the clock reprojected the importance of cyclicity onto life. Science, the study of the repetitive and regularly repetitive was born. The concepts of frequencies, electromagnetic waves, atomic spectra, bio-rhythms all followed. Philosophers explained the cosmos as basically being a clock. God became a clock maker.

And with century 21 arrives the digital clock. A number changeless for a brief period, then an instant of change, another number changeless for a moment, then a change, number, change, number, change,... What will this digital clock do to our view of time and to our world views? Will it make us aware that time may speed and slow, that the "now" may sometimes be short, sometimes long. And though ultimately cyclical, the parts of a cycle may not all be continuous, but mix before with after. Histeron proteron.

MOONMAYA.WPD June 15, 2004

SATELLITES
THE MOON AND THE MAYANS

One of the puzzling questions about the Mayan calendar and their system of time has been the origin of their 260 day "tun". This period does not seem to have an explicit astronomical basis, as does their "haab" which corresponds to our year. But the tun was as important as haab in the Mayan reckoning of time.

It has been shown in a previous scrap [2000 #43] that the tun could have been the product of their vigesimal, base 20, number system and their selection of 13 days for the week. The origin of the latter could have been the close resonance between the earth's Schuster period[1] and its rotation period. It was noted that the error between **seven** rotation periods of 86,400 seconds and 120 Schuster periods of 5059.61 seconds is 2353 seconds. While the error between **thirteen** rotation periods and 222 Schuster periods is only 33 seconds. This would make a good case for a 13 day week instead of a 7 day week, provided that the Schuster period is the geophysical cycle basic to the week.

Comparisons for the tun:

Twenty 13 day weeks = 260 days; the error to 4440 Schuster periods is 668 seconds.
Thirty seven 7 day weeks = 259 days: error to 4423 Schuster periods is 1055 seconds.
[In both cases the Schuster values exceed the rotational values]

But there is another possibility related to the tun.

The lunar sidereal period is 27.3217 days. Nineteen of these periods equals 519.1123 days. This is an error of 0.8877 days in two tuns or less than a half day per tun.

So if we wish to pick a number of days that closely represents several cycles.

From the Schuster cycle and a 7 day week	259	days
From the lunar sidereal cycle	259.56	days
From the Schuster cycle and 13 day week	260	days

The tun is a useful choice.

---

[1] The Schuster Period, t , is the limiting value in Kepler's third law, $t^2 = d^3/GM$, when the distance, d, is taken as the distance from the earth's center to its surface and where M is the mass of the earth. It is the time a satellite would take to circle the earth at the surface if the earth were a smooth sphere with no atmosphere. Or if there were a hole through the earth, it is the time an object would require to make a round trip through the hole.

TURBULENCE IN THE STREAM OF TIME

First it is necessary to distinguish between the ***present*** and the ***now***.
The Direction of Time:

The ***present*** is an instant of time that moves along the line of time in a direction past to future. This direction or "arrow of time" has been defined in terms of the second law of thermodynamics as the direction in which entropy increases. Associated with this direction of time is the concept of causality. The conventional assumption is: that which is subsequent can only be caused by that which precedes, or consequences do not play a causal role.
It is also recognized that living systems are able locally and temporally to violate the second law of thermodynamics. This property would infer that living systems can also effect conditions in which consequences can play a causal role. Indeed, this disposition in living organisms has been given a name, "purpose". [This purpose is not to be confused with a philosophical purpose of life, but is simply an agenda the organism has chosen to influence.]

The ***now*** is a zone within the stream of time in which the second law of thermodynamics has been violated. Within this zone antecedent-subsequent are no longer locked to cause-effect. Causality is free to move both from prior to later and from later to prior. Consequences may play a causal role. And living organisms seem to be able to create such "now zones". Whenever such a zone occurs in the stream of time it is in many respects analogous to turbulence in a fluid stream where the flow is in several directions at once. The ***now*** may be thought of as a turbulent eddy in the stream of time..

Two quotes are of interest in this connection:
Who controls the past controls the future; who controls the present controls the past.

—George Orwell 1984

History is what I write it to be.

—Joseph Stalin

An implication of these quotes is that people in a position of power more readily recognize this human capacity to locally and temporarily violate the second law of thermodynamics. But this power to overrule some aspects of the determinism or necessity present in the natural order is possessed to some extent by all life forms.

Notes:
The **present** is the period in which energy may be transferred. The **now** is the time zone in which information may be transferred. [or created]

The Hopi view of a determinator in the future may be considered the leading front of a now zone
The lagging front, liberation from the past, is more difficult to ascertain.
Questions:
Is there an holographic analogy in time where the part, a portion of time, may contain the whole?

Are there different topologies for time as there are for space?

2002 #70 revised

CAUSALITY AND THE DIRECTION OF TIME

Who controls the past controls the future; who controls the present controls the past.
—George Orwell 1984

The Direction of Time:

Does time always move from past to future? The direction or "arrow of time" has been defined in terms of the second law of thermodynamics as the direction in which entropy increases. And locked into this direction of time is the concept of causality. We conventionally assume that causality must operate in the same direction as the flow of time, meaning that consequences never play a causal role. But in the case of living systems, it is recognized that they are able, locally and temporally, to violate the second law of thermodynamics. This capability of living systems infers that they may also, locally and temporally, be able to alter the direction of time. This carries the additional implication that living systems can create situations in which consequences do play a causal role. Indeed, this concept of the power of living organisms to reverse the direction of time and causality has been given a name, "purpose". Living systems do direct sequences of events toward selected goals which conflicts with the idea that the future is solely determined by past causes. A power to overrule some aspects of the determinism or necessity present in the natural order seems to be possessed to some extent by all life forms.

The Present and the Now:

We distinguish between the **present** and the **now**. We may define the **present** as an instant that moves along the line of time in a direction past to future, but at possibly different rates. We define the **now** as a zone in the stream of time in which the second law of thermodynamics has been locally violated. Within this zone antecedent-subsequent are no longer locked to cause-effect. Causality is free to move both from prior to later and from later to prior, and consequences may play a causal role. Living organisms seem to be able to create such "now zones". Whenever such a zone occurs in the stream of time it is in many respects analogous to turbulence in a fluid stream where the flow may be in several directions at once. Such an intentionally controlled zone or interval of time may be thought of as a turbulent eddy in the stream of time..

Notes:

- The **present** is the only period in which energy may be transferred. The **now zone** is the time interval in which information may be transferred. [and/or created]
- The Hopi view of a determinator in the future may be considered the leading front of a now zone

Questions:

Is there an holographic analogy in time where the part, a portion of time, may contain the whole?
Are there different topologies for time as there are for space?

JOURNEY OF THE YEAR

the Journey Of the Year

One man esteems one day as better than another, while another man esteems all days alike. Let eberry one be fully convinced in his own mind.

Romans 14:5

JOURNEY OF THE YEAR

There are two kinds of time and for them we have two calendars. The first kind of time is an outer or objective time. This type of time is regarded as linear and its major attribute is duration or interval. It is our scientific and secular time and together with the secular or common calendar is used to keep our business and societal affairs coherent and synchronized. The second kind of time is an inner or subjective time. This kind of time is cyclical and its major attribute is quality or mood. It is our psychological and religious time and in conjunction with liturgical calendars enables us to tune to the seasons of the year and the day.

Whereas psychological time is inner it is nonetheless entrained by cosmic rhythms of the earth and the sky. The turning of the earth, the motions of the sun and the moon, all supply bench marks for our inner clocks. These bench marks cannot be ignored and even our linear secular time must respect their messages. An example of such a message is contained in this quotation from a current gift catalog.

> *The transition from Autumn to Advent is of all seasons the one in which the cycle of nature is most nearly complemented by the quickened sensitivity of the soul. The plaintiveness evoked by falling temperatures and leaves is followed up at once with the air of anticipation of Yuletide. At least this is how it ought to be. Throughout the ages, those peoples who have most finely attuned the passage of their years to the rhythms of the seasons have experienced those spiritual insights that are of the essence of civilization. The very idea of the West arose from such an experience, an experience given its most glorious expression in Europe's medieval epoch and its most singular evocation in the fertile imagination of the Celts. The richest literature, the grandest crafts, are alike informed, to at least some extent, of their mysterious interpenetration of nature and supernature.*

Indeed it was the Celts, with their deep sensitivity to inner time, who supplied much of the foundation for our modern liturgical calendar. The Celts divided the year into two parts marked by the feasts of Samhain (November 1) and Beltene (May 1). The period Samhain to Beltene was winter, the period Beltene to Samhain was summer. Each of these periods was in turn divided in two by so-called 'quarter days', Imbolg (February 2) and Lughnasadh (August 1). The key day of the year was Samhain, the Celtic new year day. Samhain and its eve were a time apart from the rest of the year, a time charged with a peculiar preternatural energy. The Other World, the world of spirits, dominated all mental images and spirits moved freely among men. The normal order of the natural universe was suspended and the barriers between the natural and supernatural were removed. In this time outside of time, the setting was established for those myths which symbolize the dissolution of established order as a prelude to its recreation in a new period of time. Thus in practice Samhain became a time of unbridled carousal with strong ingredients of turbulence and chaos. But it was a time of great opportunity for those with the courage to cross the bridge to the Other World and circulate in the world of the spirits. The Sidh [dwelling place in the para-world] lay open and could be occupied by humans. It is startling how much of the symbolism of Samhain and its eve remains today

in our practices at Halloween although there is little understanding of its source or belief in its roots.

But what, if anything, do these Celtic dates have to do with the rhythms of the earth and sky? Are there any solar bench marks associated with November 1 and other key Celtic dates?

T+S

PAMP6.WS1 JOURNYEAR01 11/14/86 11/17/86

SEASONS AND FESTIVALS

The year of the seasons is the interval of time which the sun requires to make a complete circuit of the sky, vernal equinox to vernal equinox, springtime to springtime. Four key events occur in this year: 1) The sun's crossing of the equator going north on or about the 21st of March, called the vernal equinox, taken as the beginning of spring. 2) The sun's attaining its maximum northerly position on or about the 22nd of June, called the summer solstice, taken as the beginning of summer. 3) The sun's crossing of the equator going south on or about the 21st of September, called the autumnal equinox, taken as the beginning of autumn. 4) The sun's attaining its maximum southerly position on or about the 22nd of December, called the winter solstice, taken as the beginning of winter.

The world of nature, the world of weather, plants and animals, is closely guided by the seasons. The seasons not only carry changes in light and dark, warmth and cold, but also changes in mood and feeling, changes in what might be termed the quality of time. For these reasons, since prehistoric times the seasons have been marked, measured and celebrated. The ritualistic observance of the solstices and equinoxes, the beginnings and ends of the seasons, was the basis for both the religious and economic life of most primative peoples. Through the centuries pagan cultures enhanced their rituals of the annual cycle. Their calendars became increasingly sophisticated, with many supplementary sacred dates being added to the solstices and equinoxes. For the religious life of more recent times, the Church proved itself adept at adopting and adapting these pagan festivals, relabeling them and gradually modifying their emphases. However, in this process, there was an inate wisdom that understood, whatever the label, there was a special significance to the dates themselves, and these must not changed. The same wisdom also saw that places that had been recognized by pagans as sacred were sacred and though a church might replace a grove or temple, the selection of locations for places of worship was not an arbitrary matter.

Of particular meaningfulness to us, because of their influence on our present calendar, are the festivals of the Celtic peoples who inhabited Britain, Ireland, Wales and much of western Europe in pre-Roman times. The Celts had established an elaborate set of annual rituals associated with the solstices and equinoxes and with four additional days, known as cross-quarter days,all with vestiges in our present calendar. Refering to the Table I, Bridgit or Imbolc, the cross- quarter day of mid-winter, celebrated on February 2, was dedicated to the Triple Goddess Brigit who represented the three phases of womanhood--maiden, mother, and crone. The Church took this as the date of the Purification of the Virgin or the Presentation in the Temple, or Candlemas but retained February 2.

Eostar, the Celtic celebration of Spring on the vernal equinox, was dedicated to the Goddess of the Dawn, taken by the

astronomical significance, saying that the [illegible]
by no "serious students of archeology."

Scientists of other disciplines are in disagreement, and have produced interesting data on the orientation and purpose of megalithic monuments.

In his *Megalithic Sites in Britain*, published in 1967, Professor Alexander Thom, who for many years held the chair of Engineering Science at Oxford, shows how the stone and wood henges of Britain of the second millennium B.C. were aligned on certain stars, were planned on the basis of a geometry which anticipated Pythagoras, and were uniformly built on a unit of measure which he calls a megalithic yard of 2.72 feet or .829 meter.

According to Thom, megalithic sites in Britain served the purpose of calendars and clocks. During the long winter nights the only indicators of time were the stars. By observing the rising and setting of stars of the first magnitude, or their

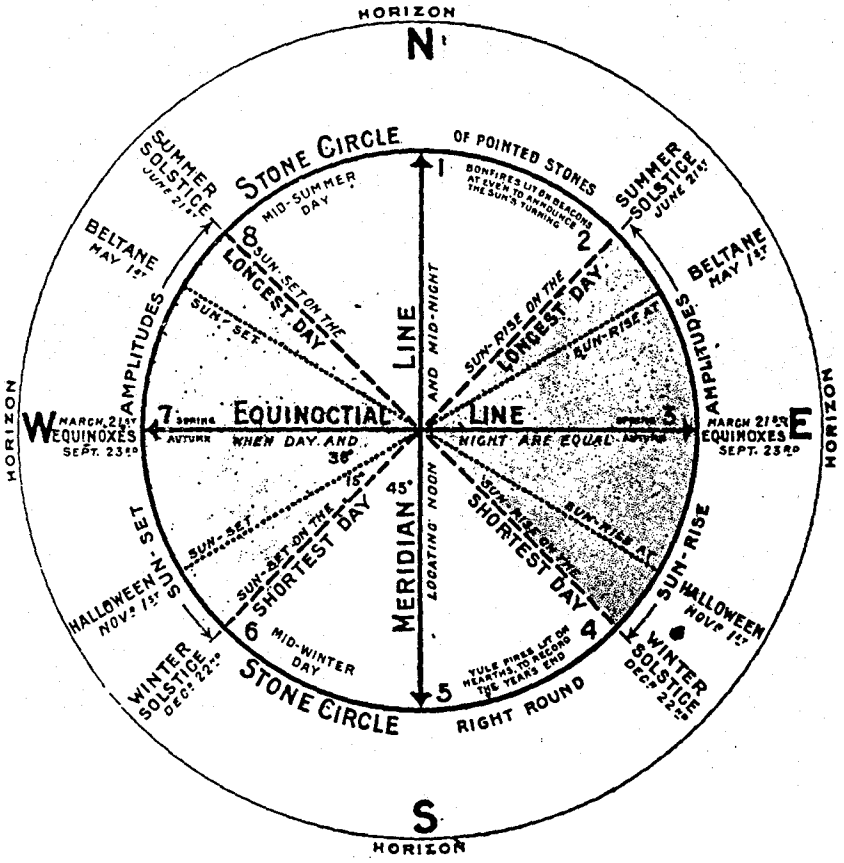
Walpurgis April 30
Beltane May 1
Hallowen Oct 31
Samhain Nov 1
Yule Dec 22
March 22 Eostar

June 22 Litha
Sept 21 Mabon
Aug 2 Lammas
Feb 2 Brigit or Imbolc

The Druidic Circle
Tompkins p 137

Stonehenge Latitude

This diagram drawn so that Solstices at ± 45°
Quarter days at ± 30°
Equinoxes at 0°



Church as appropriate for the celebration of the Resurrection of the Christ, but here, after much controversy, the date was changed to be in accord with the Hebrew lunar calendar rather than holding with the tradition of the vernal equinox.

DATE	CELTIC NAME	PRESENT NAME
February 2	Brigit or Imbolc	Candlemas
March 21	Eostar	Easter
May 1	Beltain	May Day
June 22	Litha	Midsummer
August 2	Lammas or Lughnasegh	
September 21	Mabon	
November 1	Samain	All Hallows
December 22	Yule	Christmas

Beltis is the Sabian name for the goddess Venus. Beltain, May 1, was the celebration of mid-spring given to orgiastic revels on the day after Valpurgis Night when evil was abroad. May Day retains its importance both liturgically and secularly. Its present meanings vary from honoring the Virgin to Communist International Labor Day, ~~the~~ once a most important festival in Easten Bloc countries.

Midsummer, June 22nd the summer solstice, was celebrated with bonfires and sacrifices. It is still an important festival especially in Scandinavian countries where it is accompanied with all night revelries in the glow of the midnight sun.

Lammas shortened from Lughomas, celebrated as a wake for the god Lugh on August 2, became a mid-summer fair between the hay harvest and the corn harvest. This festival has not survived except locally in parts of Ireland and Britain. Its nearest Christian derivative is the Feast of the Transfiguration on August 6th.

Mabon or Mab, the autumnal equinox, the time of the Poet, a figure of importance equal to the warrior or prince. The season for recounting and interpreting of the sagas of sky and earth, perhaps now reflected in the saga of St Michael and All Angels celebrated on September 29th. Samas, Sabian for the Sun. Samhain, the festival of the death of the year, November 1, the Celtic new year. A time when the separation between the worlds of the living and of the dead became a minimum. A foreboding time, fraught with great peril. All Hallows Eve when the world might be seized by wraiths and witches. The numena of this time are preserved today in such practices as wearing masks on Halloween to frighten the real demons and in the dedication of the next two days by the Church for the veneration (and appeasement?) of all souls and saints.

Yule, the winter solstice, along with mistletoe and yule logs has been incorporated into Christmas. The history of the change in date is obscure. Yule was the birthday of the sun god, but December 25th was the birthday of Mithraic sun god, adopted by the Church as the birthday of Jesus in the sixth century. All of the days from December 21 through December 25th are special days. The Celts reserved December 23rd as a day belonging to no month, a sort of leap day.

Helios Mithras

We can glimpse in these Celtic yearly festivals not only their

appropriateness to such activities as agriculture and animal husbandry, but their important injunctions toward making all activities compatible with the psychological quality of each season. As industrialization and urbanization decouple a culture from the natural world, the injunctions of the seasons become less important for most non-agricultural activities. But the moods and feelings of the seasons remain to puzzle and confound us. In believing time ~~has no~~ does not possess quality, but only duration, we ignore the experience of those who lived close to nature and learned to live with nature. No amount of technology nor urbanization will ever insulate us from the earth and its rhythms, we either harmonize with them or pay the price.

T+S

SEASONS1.WP5 JOEYDISK AUGUST 4,1986

A calendar provides us with a set of temporal mile-posts. Like an odometer it can be used to tell us how far we have travelled or how distant the next post is, but also like an odometer, which does not inform us of the nature of the country through which we are travelling, a calendar says nothing about the quality of the time we pass through. But since our yearly journey in time is cyclical and repetitive, past experience allows us to predict what in general we may expect as we pass different calendric mile-posts. We have learned how to relate calendric dates to the four temporal varieties we call seasons. This is possible because the seasonal quality of time is a response to the daily varying ratio of light to darkness and the height of the sun in its meridional passage, and these in turn are rigorously related to the astronomical configurations of the earth and sun.

The central problem of the calendar is to make the cycles of the day, week, month and year fit together. What makes this difficult is that, except for a week being exactly seven days, the ratios of all the cycles involve fractional parts. The number of days in a year is 365.242199, the number of days in a month is 29.530588, the number of months in a year is 12.368266 and the number of weeks in a year is 52.177, none coming out even. Many calendars have been devised to systematically allow for these fractions. The calendar currently most widely used involves making three out of four years of 365 days and the fourth year of 366 days, with additional rules for those years occurring at the turn of the centuries. The central concern being that the calendar be designed so that the dates and the seasons we are accustomed to associate with those dates stay in accord.

It was the astronomer Hipparchus who first measured the seasons in the second century B.C. He found that Winter was the shortest season and Summer the longest. His values are given in the table:

SEASON	FROM	TO	LENGTH
Spring	Vernal Equinox	Summer Solstice	92d 20.2h
Summer	Summer Solstice	Autumnal Equinox	93d 14.4h
Autumn	Autumnal Equinox	Winter Solstice	89d 18.7h
Winter	Winter Solstice	Vernal Equinox	89d 00.5h

While mile-posts allow us, when we have a map, to know when we will reach a river or mountain pass, we need to get out of the car and walk about if we are to really get a feel for the country. Similarly, while calendars allow us to know when to expect Spring or Summer, we need festivals to really get related to the season. So special days have been set aside since ancient times to celebrate the change in season or changes within a season. Usually these days have been associated with the equinoxes and solstices themselves, but frequently other days have been added. For example, the ancient Druids added 4 additional days to the equinoxes and solstices:

DATE	NAME	CELEBRATION
November 1	Samain	The New Year
December 21	Yule	The Winter Solstice
February 1	Bridgit	
March 21	Eostar	The Vernal Equinox
May 1	Beltane	
June 22	Litha	The Summer Solstice
August 1	Lammas	
September 21	Mabon	The Autumnal Equinox

Other cultures have adopted similar festivals to celebrate throughout the year. Today we have Liturgical years based on the remembrance and celebration of eclesiastical events and National Holidays based on the remembrance and celebration of historical events. We thus find we need for both calendars and

festivals to guide us through the temporal terrains modulated by the varying seasons.

Every culture has evolved customs supported with a rich literature and art to celebrate the yearly journey through the seasons. Though these customs vary in many ways, being influenced by latitude, climate, local flora and fauna, etc. it is not surprising that most share basic patterns reflecting the earth wide response to the sun's annual journey from north to south and return to north again.

JOYOUTL2.P51 DISK 7+5 AGW 11/12/87

THE TENSIONS: NATURAL TIME vs. SECULAR TIME

Man lives in a schizophrenic middle kingdom where biological physical time clashes with cultural industrial time. We ever seek to claim our independence from the great temporal symphony that orchestrates the world we are fashioned from.

Statistics tell the grim story of a civilization hell-bent on saving time on the one hand while eliminating the future on the other.

The artificial time worlds we have created have been accompanied by new values: efficiency, punctuality, regularity, predictability. They have undermined spontaniety, reflection, playfullness and choice.

What time we do have is chopped up into timy segments each filled in with prior commitments and plans. Discretionary time, once a mainstay, an amenity of life, is now a luxury.

CYBERNETICS OF TIME

The error signal between the is time of factory schedules, nine to five, rush hour, and the ought time of the earth's rhythms and our own biological clocks has created a tension which has been the source of mental and physical disease.

EXAMPLES OF THE DISTORTION OF TIME

SPEED UP
- Nine to five
- 42 minute lunch
- Three day mourning

CHOPPING AND ELEMINATING
- The Sabbath
- United Nations Day
- Seasons alloted to sports

RESYMBOLIZING
- Armistice Day
- May 1
- Christmas

THOSE WHO CONTROL THE CALENDAR, CONTROL YOUR LIFE

We can tune only to natural rhythms, though we can adapt to the factory rhythm by paying the price of irritation, frustration, depression and ultimately illness.

NATURAL TIME

Before we can get anywhere with the problem of our present with ourselves and the earth, we must resanctify time. To do this:

1) We must recognize the role that both time and our worldview of time play in life. The worldview of time is as important to human freedom and advancement as the worldview of the source of sovereignty.

2) We must restore quality to our worldview of time. In removing quality from time, we have removed all of the instruments of the orchestra but the metronome. In making each moment of time like every other moment of time, we have high entropy time, a time rendered incapable of energizing.

3) We must reject the linearization of time. Cyclical time emphasizes focusing on each part of the cycle at its proper season. This allows us to live in the present and to have presence. Linear time does not focus on what is being done now, but on some yet to come state. Linear time thus allows us to be manipulated.

> "People are told that in return for sacrificing their time, they will be assured access in the near (or distant) future to an idylic timeless kingdom"

While this is a powerful dynamic for a society, it lends itself to the enslavement of society.

4) Finally, we must honor the natural rhythms, both our own and theearth's. We must recognize them and besensitive to them before we can tune to them.

JOYOUTL.~~W84~~ p51 DISK: T+S AGW 11/12/87

OUTLINE FOR JOURNEY OF THE YEAR PRESENTATION, NOVMBER 13, 1987

INTRODUCTION

Steiner: "No person should use a device whose inner workings and proper use that person did not understand."

The second year curriculum: Personal operating manual

Our energy---food, diet	
Our time--calendar, schedule	
Our information--knowledge, skills	
Our relationships--community, work	
Our context--space, ecology	externals
Our psyche--images, moods	internals
Our worldview--values, purposes	

HEALTH IS ALL OF THESE IN TUNE

IMPORTANCE OF TIME

ONTOLOGICAL —> coherence

Life, Earth and the Universe are partners pulsing in unison to create through a rhythmic bond an organic whole.

The infrastructure of the world is not matter, it is rhythm.

Instead of perceiving time as an attribute of matter, we now perceive the material world as merely an expression of a more fundamental temporal reality.

[quantum mechanics and cosmology]

SOCIETAL/CULTURAL

The worldview of an individual and of an age, i.e. the perception of life and things preferred, is essentially a view of time. J.T.Fraser

Whether, sacred or secular, every calendar expresses the essential politics of a culture. No other device is as critical as the calendar in forging a sense of group cohesion.

[e.g. the Jews, the French and Russian revolutions]

BIOCHRONOLOGY AND CIRCADIAN RHYTHMS

[Special page]

THE DRUMMERS

[Special pages]

JOYLECT2.WS4 11/04/87

LECTURE ON THE JOURNEY OF THE YEAR
for the Second Year Macrobiotic Curriculum

First, let us ask: to the beat of what drummer do we march?

Henry Thoreau spent eight months in the year 18xx at Walden Pond. Ordinarily history is made by kings, generals and masses of people, and it is highly unusual for an adventure in solitude to become an historical event. But that is what Walden Pond became, an historical mile post on humanity's journey toward understanding itself and its relationship to the earth. While at Walden, Thoreau became aware that time had a different quality. There was a different rhythm from that of the town. He moved "to the beat of a different drummer". Even that there was a different drummer could never have been perceived without the sensitivity generated by his departure to Walden and his subsequent return to town. The rhythm of the town and city, even in 18xx had drowned out the basic pulse of nature. And that there was a different pulse had all but been forgotten.

Jeremy Rifkin, in his 1987 book, "TIME WARS", identifies the historic drummers or time givers of Western cultures:

First, there was the earth. The seasons measured time for man. The sprouting, maturing, fruition and sleep of plants, the migrations and hibernations of animals. These were the drum beats that informed man what time it was.

Second, there was the sky. Man observed that events on earth were related to events in the sky. The movement of the sun to the north presaged springtime; its greatest height, summer; its southward turn, autumn; and its lowest height, winter. While the cycle of the seasons was the fundamental rhythm of both earth and sky, man had learned there was a certain precision in the cycles of the sky which was lacking in the rhythm of the earth.

Third, there was need for divisions of time shorter than the yearly cycle and longer than the daily cycle. Man divided the annual cycle into smaller intervals. The waxing and waning of the moon provided a shorter cycle of convenience, one whose seasons were far more subtle than those of the sun. Some cultures went on to even shorter intervals. The Hebrews introduced the seven day week, a period seemingly independent of both earth and sky. The Mayans instituted a 20 day period and a 13 day period and devised a complicated set of their beat periods. The gap from the year to the day had been spanned and calendars were born. Throughout most of historic time the calendar was drummer.

Fourth, the Romans and other powers with extensive military concerns found it necessary to subdivide the day into shorter intervals--the watch and the hour. Monks, beginning in the sixth century recognizing the changes in the quality of time throughout the daily cycle, devised rigorous schedules which broke the day into set times for prayer, work, sleep, eating, and study. In the 13th century the mechanical clock was invented and the day was divided into more precise intervals, and As the precision of clocks improved, ever shorter intervals of time were introduced. The hour was followed by the minute and the minute by the second.

A fifth drummer has been added by Rifkin to the four historic time givers. This he calls the <u>program</u>, by which he means the further division of time into even finer intervals, measured in nanoseconds and interfaced only with computers.

But as succesive drummers took up the beat, something was happening to the perception of time. As the beat became faster with the emphasis shifting to ever shorter intervals, perception of the quality of time diminished. And as periods measured in minutes and seconds found industrial and scientific importance, the perception of time as cyclical was lost. Time became both linear and without quality. Time was nothing but what a clock measured. The answer to the question, "What time is it?" was no longer. "Time to work", "Time to play", it had become but a number.

Today most of us agree with the scientific view that time is linear and

without any attribute of quality. Every instant is like every other instant, and it is erroneous and deceptive to ascribe quality to time just because we feel different at different times and do different things at different times. But is this view true to our experience? From time to time the world seems to go on hold. A pervasive paralysis sets in. Both thought and activity cease. No business is done, no initiatives undertaken. There is only the momentum of earlier activities. Even perception ceases resulting in these moments of paralysis going unperceived. However, if one hears a different drummer, these moments of standstill are seen with amazement as all activity, even that of a busy city, suddenly comes to a halt. Thought and activity (including perception) comes in spurts, in pulses, as though we are indeed responding to the beat of some drummer. Such moments are when the pulse of nature silences the synthetic schedules of our urban drummer. All my life I have experienced these moments of standstill, whether I am alone on a western ranch or on Fifth Avenue in New York City. One such time is so powerful that it has received a name: the gloaming.

A similar phenomenon pointing to quality in time is that we sometimes find ourselves in a "phase interstice". We are the only ones about. At other times we seem caught in whirlpools of activity, simultaneous comings together of so many as to be totally improbable.

APHSJOY.P51 DISK: JOF902 5/01/91

In every human activity it is important to keep asking ourselves what we are trying to do--indeed, what we are <u>really</u> trying to do. In fact, if some question were to be carved in stone or cast in gold above the portals through which we daily pass, it might best be: WHAT ARE WE TRYING TO DO?

We must certainly ask ourselves this question in connection with the studies that we have innaugerated with respect to the so-called "Journey of the Year".

Angst, depression, enthusiasm and doubt have their seasonal fluctuations. This is a fact. What do we do with this fact? What effect does knowledge of these facts have ~~on their affects on~~ or us? Does it escalate our depressions, stabilize them or damp them out and even reverse them? Does this knowledge produce positive, negative, or even inverse positive feedback? It may do any of these things. The effect of knowledge is to give a measure of control over where we would hope these feelings would go--increase, stabilize or dampen out and reverse.

"Do not look upon the world as reality but as the message that is sent to us by reality." David Spangler

We think of our senses as the transmitters of an outer reality to our consciousnesses, but the senses are only the final link of a long process -- the face of the TV tube so to speak--consisting of transmitters, expanses of transmission by space, wire and cable, circuits antennae, receivers--all of which codify the reality and send it on its way to us. How we interpret the message depends on what code book we possess. But there is also the danger of confusing what is on the face of the tube with reality. (The modern version of Plato's cave.)

BOOK OF TIME

(E) ENTROPY. 051 DISK: 3 of 4 #2

THE GREAT DEMOCRATIZING, EGALITIZING, HOMOGENIZING

The mountains have been leveled, the valleys have been filled and there exists only a monotonous plain, every place has become like every other place, every time has become like every other time, the unique, the special, the sacred have been obliterated. This is not only the work of the Second Law, it is the work of the revolutions of the enlightenment--or perhaps more accurately the Second Law working through the revolutions of the enlightenment

In more detail this has been effected with the aid of technology. The advent of lighting with electricity eliminated the differnce between day and night. Air conditioning and central heating mitigated the essences of the seasons and what the automobile has wrought in our psyches is too pervasive and ubiquitous to even be perceived. Another technology allows us to have New Zealand strawberries on our tables in mid-winter and for a price to have any fruit in any season. But what technology began our modes of urbanization extended. The structure of our cities has removed us from the rhythms of nature and the layers of concrete and asphalt that we have laid down to physically insulate us from the ground well serve to symbolize the barrier that separates us spiritually from the earth.

What we have done to space we have also done to time. Starting perhaps with a distaste for blue laws, we began a campaign to desacrilize the week. The uniqueness of the seventh day has disappeared. Festivals have been removed from their historic places, frequently relabeled, and sacrificed to the cultural primacy of 'the long weekend'. Only to mention one, Armistice Day, selected for the 11th hour of the 11th day of the 11th month as a solemn symbolic reminder of our place in time with respect to human future and the nature of war, now relabled and constantly reshuffled in date to lengthen the weekends.

Having smoothed out the seasonal oscillations of the year has perhaps given us some feeling of immunity to the laws of planetary change. But over a longer timespan our efforts to overcome change have rendered us more vulnerable to change. We have mistaken the artificial world of our creation for reality and have come to view the Earth as but a resource to feed our cultural whims. But in ignoring and violating the context in which we have our being we have cut the arteries of our spiritual nurture and find that our most strenuous efforts to continue our fallacies are failing to sustain them.

(1) SEASONS

ENTROPY p 2

What is required of those who must walk on this shore whose path is obscured? If our destination is hidden, if only the immediate path may be discerned, how do we proceed? We can only focus on how we walk and where we step, taking each pace with care. There are those who refuse to proceed without knowing the destination. There are those who abandon the path and set off in various directions. But no matter which direction we take, to all the way ahead is obscured.

Since this is so, the wisest no longer dispute the directions to take, but search for how most safely to walk. But there is further wisdom to be found. Careful observation will permit us to discern greater portions of the path than those that lie within our box. We notice that certain features repeat after so many steps, and counting we see the same patterns repeating at different scales and the path begins to emerge as a fugue of interlaced familiar melodies. Then despite our limited perception, when we take our steps in time with these melodies, we find the path may be followed not only with safety but with joy. Then as our skill increases, we find we may also safely step to variations of the familiar themes, and finally we learn confidently to step, to melodies new and more beautiful than any we have known. then to dance

Today
I 2 kinds of time
work + weekend
(with an occasional long weekend)

(J) SYMBOLOGY DISK: JYY02
Book of Time
Book of Symbols

JOURNEY OF THE YEAR

There are many symbolic languages useful for describing the quality of time. We are indeed persuaded by our experience that time does have quality, for not every moment of equal duration, as measured by a clock, is like every other moment. Days, for example, are felt to be different in quality just as certain hours of the day and night have characteristic qualities. J. Eric S. Thompson writes in his study of the Maya (Maya Hieroglyphic Writing, p 66):

> "Throughout history man has ascribed favorable or malevolent powers to certain days. At different times and in varying places, the supposed influences of days have played a not inconsiderable part in the functioning of cultures.
>
> Nowhere did those influences attain the importance with which they were invested by the peoples of Middle America. There the life of the community and the acts of the individual were rigidly adjusted to the succession of days with their varying aspects. Each day belonged to a god who took a lively interest in his duties; happy and sorrowful days succeeded each other. The day ended; the officer of the day was relieved. The one next in charge might be of a very different nature to his outgoing comrade; the mood changed as abruptly as in a Tschaikowsky Symphony."

The use of a god of the day as a symbolic device for representing the quality of time is not peculiar to the Maya. Similar to the idea of labeling days Caban--youth, Etz'nab--stone knife, Cauac--rain, as done by the Maya, is

sunspot

(J)

the assigning of days to certain saints, St. Thomas, St. John Baptist, St. Michael Archangel, etc. in the Christian tradition. Whereas the saint does not rule the day--we rather dedicate the day to the saint and meditate on his or her particular virtues on that day--in one very real sense the character of the saint governs the mood of those who get in touch with or tune-in on the saint on his day. Perhaps a greater difference between the Mayan and the Christian traditions is in the fact that the Christian calendar has excluded (or closed its eyes to) the malevolent influences. Jung would find this denial of the shadow a somewhat risky business. Only perhaps in Halloween, Valpurgis Eve, Carnival, Fasching, Mardi Gras etc. do we acknowledge the existence of the counter beatific influences. As we shall learn these are very important and cannot be neither denied nor ignored in the Journey of the Year.

I would like to employ an ancient symbolic device of time tested usefulness for our exploration of the yearly cycle to enable us to organize the concept of quality of time. This device is to assign to the various sub-divisions of the year, qualities symbolized by the basic "elements", Earth, Air, Water and Fire in their various combinations.

2

We meditate on the following tapestry of time

CALARIVE.P61 D|S|R: JoY02 From DONNA's flyer

This is the time of year the calendars arrive in the bookstore. The vivid, colorful images and thoughtful quotations seem to get better each year. [We enjoy opening them as much as you will enjoy making your selections.] Calendars, of course, suggest cycles of light and dark, seasons of growth and dormancy as well as times for scheduling and planning our work and recreation. But perhaps at a deeper level, calendars remind us of the passage of time...how early or late is it and what will next year bring?.

If we are merely asking where are we in relation to the day of the month or the time of the next full moon or when it will be spring, we need no special calendar. But if as Emerson once said **"there is a relation between the hours of our life and the centuries of time ... the hours should be instructed by the centuries and the centuries explained by the hours"**, we need something more than microchips implanted in digital clocks and watches to mark the hours and the centuries.
calendars

Contemplative living provided many markers in days when life was structured by the rhythms of farming or fishing and travel was limited by seasons and weather. Living had to be in tune with the journey of the year in order to survive. But today we live in an environment supporting the illusion that there are no differences in the hours or the centuries. Our complex 'high' technology allows commerce and travel as well as surgery or baseball to occur at any time of the day or night. Holidays have become times when families gather together to view national sports events rather than observe 'holy' days, and most of us are indignant if our favorite supermarket or laundrymat is not open seven days a week. This loss of cycles in our outer experience of the passage of time coincides with our inner demand for instant gratification. But the challenge for us in this unnatural context is to consciously live the journey of the year. [The **ESSENE BOOK OF DAYS**($12.95,paper) offers a journal format and meditation guide to do just that. It helps] tune our awareness to the seasons of the world we live in and stop being carried away by the outer furies of trivia and stress.

ON RELIGION AND TIME

TIMEXPL1, P51

WHAT IS TIME?

CLASSICAL THEOLOGICAL VIEW

The Creation in time is a revelation of the eternal acting of God.
St. Albertus Magnus

THE WORLD WAS MA WITH TIME NOT IN TIME
St. Augustine

CLASSICAL SCIENTIFIC VIEW

Time is what is measured by a clock.
Bridgeman

ON THE IMPORTANCE OF TIME

The worldview of both an individual and of an age, i.e. the perception of life and the conception of things preferred, is essentially a view of time.
J.T. Fraser, Time Wars p7

FIRST

ON ATTRIBUTES OF TIME IN THE PHYSICAL WORLD

The key to comprehending space and time is the obvious fact that space is the relationship between things and other things while time is the relationship between things and themselves.
Guy Murchie, The Seven Mysteries of Life, p331

If there were no things there would be no space; if there were no changes in things there would be no time.
J.B. Priestley, Man and Time p104

Everything may change, but unless the changes take place at very different speeds we could not be aware of any of them.
J.B. Priestley, Man and Time p66

TIME TRANSCENDS THE PHYSICAL WORLD

Time is not a sensory experience. It is only inferred from sensory phenomena.

LAST

MODERN THEOLOGICAL VIEW

If we are to resacrilize life, we must first resacrilize time.
Rifkin, Time Wars p4

MODERN SCIENTIFIC VIEW

Instead of perceiving time as one of the attributes of matter, we now perceive the material world as merely an expression of a more fundamental temporal reality.

Add the Principles from CLOKTIME.P51 and + OTHER APHORISMS ON TIME

TIME7.P51 DISK:TIME 1973

Taken from the Introduction to the book, Tools of Astrology Houses.
by AGW

The hands of the clock display but a small part of what our consciousness experiences as the phenomenon of time. Not only can human consciousness expand a minute of clock time to what seems hours or contract an hour to what seems only minutes but our subjective experience impresses upon us the reality that time possesses much more than mere duration. Time is also rich in quality. All of us continually experience the moods of time: The cycle of the day with its changing hours of expectancy, vibrancy, stillness and gloom; the cycle of of the year with its seasons of awakening, activity, fruition and sleep; even the cycle of lunation with its more subtle phases of expansiveness, heaviness, closedness and emptyness. These cycles, through all of the nuances created by their superposition, lead us to feelings that the time may be propitious or out of sorts, focused ~~on~~ or diffused. These basic cycles together with other still more subtle cycles provide us with the fact that, in quality two instants of time are never exactly alike, and that the common physical conception of time as linear and uniform, possessing only sequence and duration, is far too naive a viewpoint for an adequate description of the richness of the human experience of time.

cf kairos

The quality of time impressed itself on human awareness long before there existed adequate psychological techniques for independently measuring the states of the psyche that reflect the quality of time. Ancient peoples overcame these lacks through their adaptation of the movements and patterns in the sky for the measure of rhythms and the symbolization of psychologicl esssences. The markings in the sky were more permanent and more accurate than any available written language. They were an indelible and universal display whose observation permitted the ready retrieval of the phases of the multitudionous cycles basic to the cosmos and to life.

OUR TWO TYPES OF TIME

There are two kinds of time and for them we have two calendars. The first kind of time is an outer or objective time, **chronos.** This type of time is linear and its primary attribute is duration. It is scientific time and secular time and together with the common calendar is used to keep our business and social affairs coherent and synchronized.

The second kind of time is an inner or subjective time, **kairos.** This kind of time is primarily cyclical and its principle attributes are quality and propriety. It is biological time and religious time and in conjunction with liturgical calendars enables us to tune to the seasons of the year. It tells us when it is proper to be born and to die, to plant and to pluck, to weep and to laugh, to get and to lose.

Although liturgical time is inner it is nonetheless entrained by the cosmic rhythms of the earth and the sky. The turning of the earth, the motions of the sun and the moon, all supply bench marks for our inner clocks. These bench marks cannot be ignored by our inner clocks even though our secular time ofttimes denies them.

Inner time is amplified by this message from a current gift catalog.

> *The transition from Autumn to Advent is of all seasons the one in which the cycle of nature is most nearly complemented by the quickened sensitivity of the soul. The plaintiveness evoked by falling temperatures and leaves is followed up at once with the air of anticipation of Yuletide. At least this is how it ought to be. Throughout the ages, those peoples who have most finely attuned the passage of their years to the rhythms of the seasons have experienced those spiritual insights that are of the essence of civilization. The very idea of the West arose from such an experience, an experience given its most glorious expression in Europe's medieval epoch and its most singular evocation in the fertile imagination of the Celts. The richest literature, the grandest crafts, are alike informed, to at least some extent, of their mysterious interpenetration of nature and supernature.*

It is impossible to understand by intellect alone the yearly sequence of rituals and Holy Days, why one comes after the other or why this one now and that one later. Yet there is a profound logic in them and the sequence leads people somewhere, to something higher, provided they are in a state of openness, being neither enthusiastic nor rejecting. Otherwise it all passes you by.

The Metorpolitan Anthony

The world is imprisoned in its own activity
except when actions are performed as worship
of God.
Therefore let us perform each action
sacramentally and be free of all attachment
to results.

The Gita

Commit thy work unto the Lord
and thy thoughts shall be established.

Proverbs 16:3

For the current of our spiritual life creeds and rituals are channels which may thwart or help, according to their fixity or openness. When a symbol or spiritual idea becomes rigidly elaborate in its construction, it supplants the idea which it should support. In art and literature metaphors which are the symbol of our emotional perceptions excite our imagination but do not arrest it. For they never claim a monopoly of our attention; they leave open the way for the endless possibility of other metaphors. They lose their artistic value if they degenerate into fixed habits of expression. Shelley, in his poem on the skylark pours out images which we value because they are only a few suggestions of the immeasurableness of our enjoyment. But if, because of their fitness and beauty, a law were passed that while thinking about a skylark these images should be treated as final and no others admitted, then Shelley's poem would at once become false; for its truth is in its fluidity, in its modesty, which tacitly admits that it has not the last word.

Rabindranath Tagore

And where does one begin?

Change your ways of eating, what you eat, how you eat and how you think about your food. Remember that food is of life and for life and therefore should neither be wasted nor eaten unconsciously.

Enter into the celebrations and rituals of the Journey of the Year. Experience the appointed seasons and their rituals. But preserve for yourself your own special times and private rituals.

Revere all sacred spaces, those sacred to the Earth, those sacred to life and those sacred to other beings. Create and preserve spaces that will be sacred to you.

Do all of this with neither reluctance nor enthusiasm. Be open to what comes, but be without expectations.

SEATTLE1.DOC DISK:JOYO3 September 26, 1991

CHIEF SEATTLE'S REPLY

(In 1854, the Great White Chief in Washington made an offer for an area of Indian land, promising a reservation for the Indian people. Here is Chief Seattle's reply:)

How can you buy or sell the sky, the warmth of the land? The idea is strange to us. If we do not own the freshness of the air and the sparkle of the water, how can you buy them?

Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every clearing and humming, insect is holy in the memory and experience of my people. The sap which courses through the trees carries the memories of the red man.

The white man's dead forget the country of their birth when they go to walk among the stars. Our dead never forget this beautiful earth, for it is the mother of the red man.

We are part of the earth and it is part of us. The perfumed flowers are our sisters; the deer, the horse, the great eagle, these are our brothers. The rocky crests, the juices in the meadows, the body heat of the pony, and man--all belong to the same family.

So, when the Great Chief in Washington sends word that he wishes to buy our land, he asks much of us. The Great Chief sends word he will reserve us a place so that we can live comfortably to ourselves. He will be our father and we will be his children. So we will consider your offer to buy our land. But it will not be easy. For this land is sacred to us. This shining water that moves in the streams and rivers is not just water but the blood of our ancestors. If we sell you land, you must remember that it is sacred, and you must teach your children that it is sacred and that each ghostly reflection in the clear water of the lakes tells of events and memories in the life of my people.

The water's murmur is the voice of my father's father. The rivers are our brothers; they quench our thirst. The rivers carry our canoes, and feed our children. If we sell you our land, you must remember, and teach your children, that the rivers are our brothers and yours, and you must henceforth give the rivers the kindness you would give any brother.

We know that the white man does not understand our ways. One portion of land is the same to him as the next, for he is a stranger who comes in the night and takes from the land whatever he needs.

The earth is not his brother, but his enemy, and when he has conquered it, he moves on. He leaves his father's graves behind, and he does not care. He kidnaps the earth from his children, and he does not care. His father's grave, and his children's birthright, are forgotten. He treats his mother, the earth, and his brother, the sky, as things to be bought, plundered, sold like sheep or bright beads. His appetite will devour the earth and leave behind only a desert.

I do not know. Our ways are different from your ways. The sight of your cities pains the eyes of the redman. But perhaps it is because the red man is a savage and does not understand.

There is no quiet place in the white man's cities. No place to hear the unfurling of leaves in Spring, or the rustle of an insect's wings. But perhaps it is because I am a savage and do not understand.

The clatter only seems to insult the ears. And what is there to life if a man cannot hear the lonely cry of the whippoorwill or the arguments of the frogs around a pond at night? I am a red man and do not understand.

The Indian prefers the soft sound of the wind darting over the face of a pond, and the smell of the wind itself, cleaned by a midday rain, or scented with the pinon pine.

The air is precious to the red man, for all things share the same breath--the beast, the tree, the man, they all share the same breath. The whit,i; man does not seem to notice the air he breathes. Like a man dying for many days, he is numb to the stench.

But if we sell you our land, you must remember that the air is precious to us, that the air shares its spirit with all the life it supports. The wind that gave our grandfather his first breath also receive's his last sigh.

And if we sell you our land, you must keep it apart and sacred, as a place where even the white man can go to taste the wind that is sweetened by the meadow's flowers.

So we will consider your offer to buy our land. If we decide to accept, I will make one condition: the white man must treat the beasts of this land as his brothers. I am a savage and do not understand any other way.

I have seen a thousand rotting buffaloes on the prairie, left by the white man who shot them from a passing train. 1 am a savage and I do not understand how the smoking iron horse can be more important than the buffalo that we kill only to stay alive.

What is man without the beasts? If all the beasts were gone, man would die from a great loneliness of spirit. For whatever happens to the beasts, soon happens to man. All things are connected.

You must teach your children that the ground beneath their feet is the ashes of your grandfathers. So that they will respect the land, tell your children that the earth is rich with the lives of our kin. Teach your children what we have taught our children, that the earth is our mother.

Whatever befalls the earth befalls the sons of the earth. If men spit upon the ground, they spit upon themselves.

This we know: the earth does not belong to man; man belongs to the earth. This we know.

All things are connected like the blood which unites one family. All things are connected. Whatever befalls the earth befalls the sons of the earth. Man did not weave the web of life; he is merely a strand in it. Whatever he does to the web, he does to himself.

Even the white man, whose God walks and talks with him as friend to friend, cannot be exempt from the common destiny. We may be brothers after all. We shall see.

" One thing we know, which the white man may one day discover--our God is the same God. You may think now that you own Him as you wish to own our land; but you cannot. He is the God of man, and His compassion is equal for the red man and the white. This earth is precious to Him, and to harm the earth is to heap contempt on its Creator.

The whites too shall pass; perhaps sooner than all other tribes, contaminate your bed, and you will one night suffocate in your own waste. But in your, perishing you will shine brightly, fired by the strength of the God who brought you to this land and for some special purpose gave you dominion over this land and over the red man.

That destiny is a mystery to us, for we do not understand when the buffalo are all slaughtered, the wild horses are tamed, the secret corners of the forest heavy with scent of many men, and the view of the ripe hills blotted by talking wires.

Where is the thicket? Gone. Where is the eagle? Gone. The end of living and the beginning of survival.

LITYR

PHYSPIR.PRO DISK:JOY03 Physical & Spiritual Experien

THE PHYSICAL and SPIRITUAL YEARS

It has taken many centuries to amass our present knowledge of the physical journeys of the Earth and its neighbor celestial objects, but certain basic things were known quite accurately a very long time ago, as evidence from Egyptian, Chinese, and Chaldean records show$ --and as can be deduced from monuments such as Stonehenge. We have learned that the earth has a physical journey which takes it in an elliptical orbit about the sun whose greatest distance is 152 million kilometers and whose least distance is 147 million kilometers. It completes this orbit in 365.2422 days being closest to the sun on January 2-5, between New Years and Epiphany, and most distant from the sun on July 3-6. The rotational axis of the Earth is tilted so that the sun appears to move in an annual north-south path, reaching its greatest northern position about June 21 and its greatest southern position about December 21. It is at midpath, i.e. on the equator, when the length of day and night are the same, near March 21 and September 21. Other physical observations reveal that the mean speed of the earth in its orbit is 30 kilometers per second.

We have also learned that the sun itself is moving through space taking its family of planets with it, so that the elliptical orbits are stretched out in space like the coils of a giant spring, no orbit ever covering the exact same space in its repetitions. Measurements show that the sun, together with the planets, is moving with respect to other nearby stars, with a speed of 20 kilometers per second along a path directed toward the constellation of Hercules, the apex of motion being roughly marked by the bright star Vega.

While the physical world and its year rest primarily on a framework of space and time, the larger world and year that we experience requires a framework more elaborate than the physicist's kind of space and time. For example, the physicist views time as an ongoing frame whose duration can be measured by clocks of various sorts and whose intervals are all equatable to one another provided their duration is the same. But our living experience tells us that we do not sense each interval of time in the same way. Mental phenomena require a dimension of time that transcends the physicist's definitions and measurements. We experience that the Earth repeats a yearly spiritual journey and this journey impresses itself upon our inner lives, as the Earth's physical journey impresses itself on our physical lives.

There are spiritual seasons as well as physical seasons. Intervals of time in different seasons, even though of equal duration, have a different <u>quality</u>. Days, for example, have different feelings, different flavors, different moods. It is in addressing our experiences of these differences that the spiritual or liturgical year has its inception. There thus coexist two annual cycles, a profane or "peri-cycle" giving the order of events in

chronological sequence, and a sacred or "dia-cycle" displaying events in the order of their spiritual unfoldment.

Some contrasting attributes of the physical and spiritual worlds and cycles may be listed as follows:

	Physical/Secular	Spiritual/Sacred
1)	peri or causalistic	dia or synchronistic
2)	continuity (=> real)	discontinuity
3)	contradictory	complementary (facets)
4)	adversarial	harmonious
5)	competitive	cooperative
6)	contiguous	everywhere and nowhere
7)	intersect/meet	union/join
8)	--> paradox	--> mystery

As in the case of knowledge of physical phenomena, already millennia ago primitive peoples had learned a great deal about the spiritual orbit of the Earth. This knowledge was contained in the festivals, sacred days, and anniversaries solemnized in their religious traditions. It is through the study of these religious traditions, together with the explorations of our own inner temporal patterns that we discover the "elements of the Earth's spiritual orbit".

In comparing contemporary liturgical years with the patterns developed by earlier cultures, we find many coincidences. These coincidences cannot be explained merely as being convenient emulations or plagiaristic accommodations taken to mollify converts from older practices. The coincidences point to an essential temporal pattern that must be present in every authentic religious calendar. For example, the adoption by Christians of December 25th, the birthday of the sun god of Mithraism, for the date of the Nativity, was not just an expedient step to survive under the decrees of the Emperor Aurelian, it was guidance leading to the period of time having the proper qualities for the specific symbolism bestowed on it. It was an acknowledgement of December 25th as a key day of the year, whatever specific interpretation be given it.

THE ANGLICAN LITURGICAL YEAR
THE FIXED DAYS

THE BOOK OF COMMON PRAYER--1928		THE BOOK OF COMMON PRAYER--1976
JANUARY		
1	The Circumcision of Our Lord Jesus Christ	1 The Holy Name of Our Lord Jesus Christ
6	The Epiphany	6 The Epiphany
		First Sunday after Epiphany The Baptism of Our Lord Jesus Christ
		18 The Confession of St. Peter
25	The Conversion of St. Paul	25 The Conversion of St. Paul
February		
2	The Purification of the Blessed Virgin Mary	2 The Presentation of Our Lord Jesus Christ
24	St. Matthias the Apostle	24 St. Matthias the Apostle
March		
		19 St. Joseph
25	The Annunciation of the Blessed Virgin Mary	25 The Annunciation of Our Lord Jesus Christ
April		
25	St. Mark the Evangelist	25 St. Mark the Evangelist
May		
1	St. Philip and St. James, Apostles	1 St. Philip and St. James, Apostles
		31 The Visitation of the Blessed Virgin Mary
June		
11	St. Barnabas the Apostle	11 St. Barnabas the Apostle
24	The Nativity of St. John Baptist	24 The Nativity of St. John the Baptist
29	St. Peter the Apostle	29 St. Peter and St. Paul, Apostles
July		
		22 St. Mary Magdelene
25	St. James the Apostle	25 St. James the Apostle
August		
6	The Transfiguration of Our Lord Jesus Christ	6 The Transfiguration of Our Lord Jesus Christ
		15 St. Mary the Virgin
24	St. Bartholomew the Apostle	24 St. Bartholomew the Apostle
September		
		14 Holy Cross Day
21	St. Matthew, Apostle and Evangelist	21 St. Matthew, Apostle and Evangelist
29	St. Michael and All Angels	29 St. Michael and All Angels
October		
18	St. Luke the Evangelist	18 St. Luke the Evangelist
		23 St. James of Jerusalem, Brother of Our Lord
28	St. Simon and St. Jude, Apostles	28 St. Simon and St. Jude, Apostles
November		
1	All Saints	1 All Saints' Day
30	St. Andrew the Apostle	30 St. Andrew the Apostle
December		
21	St. Thomas the Apostle	21 St. Thomas the Apostle
25	The Nativity of Our Lord Jesus Christ	25 The Nativity of Our Lord Jesus Christ
26	St. Stephen, Deacon and Martyr	26 St. Stephen, Deacon and Martyr
27	St. John, Apostle and Evangelist	27 St. John, Apostle and Evangelist
28	The Holy Innocents	28 The Holy Innocents

THE ANGLICAN LITURGICAL YEAR
THE MOVEABLE DAYS

THE BOOK OF COMMON PRAYER–1928	THE BOOK OF COMMON PRAYER–1976
The first Sunday of Advent falls on the Sunday nearest to St. Andrew's Day, November 30.	
	The Baptism of Our Lord Jesus Christ is celebrated on the first Sunday after Epiphany.
Septuagesima Sunday, the third Sunday before Lent	
Sexagesima Sunday, the second Sunday before Lent	
Quinquagesima Sunday, the Sunday before Lent	
Ash Wednesday, 40 days before Easter	Ash Wednesday, 40 days before Easter
Palm Sunday, the Sunday before Easter	The Sunday of the Passion, Palm Sunday
Maundy Thursday	Maundy Thursday
Good Friday	Good Friday
Holy Saturday	Holy Saturday
Easter Even	Easter Eve
Easter Day	The Sunday of the Resurrection, or Easter Day

Easter falls on the first Sunday following the full moon which happens upon or next after the 21st of March. If the full moon falls on a Sunday, then Easter is the Sunday following. For this purpose the full moon is not the astronomical full moon, but is reckoned as 14 days following the new moon.

Rogation Sunday, five weeks after Easter	
Ascension Day, 40 days after Easter (a Thursday)	Ascension Day
Whitsunday, seven weeks after Easter	The Day of Pentecost: Whitsunday
Trinity Sunday, eight weeks after Easter	The First Sunday after Pentecost: Trinity Sunday

ROMCATH1.P51 DISK:JOURNY0YEAR October 18, 1990

ROMAN CATHOLIC SAINTS DAYS
AFTER VATICAN II, 1963

REFERENCE: SAINTS IN SEASON
ADOPTED 1969, POPE PAUL VI

JAN 1	THE SOLEMNITY OF MARY MOTHER OF GOD
JAN 21	ST. AGNES d 304
JAN 25	THE CONVERSION OF ST. PAUL
JAN 26	ST. TIMOTHY AND ST. TITUS
JAN 28	ST. THOMAS AQUINAS 1225-1274
FEB 1	ST. BRIGID (IRELAND) ~~July 3~~
FEB 2	THE PRESENTATION OF THE LORD
FEB 22	THE CHAIR OF ST. PETER, APOSTLE
MAR 1	ST. DAVID (WALES)
MAR 17	ST. PATRICK (IRELAND)
MAR 19	ST. JOSEPH
MAR 25	THE ANNUNCIATION OF THE LORD
APR 13	ST. GEORGE
APR 25	ST. MARK, EVANGELIST
MAY 1	ST. JOSEPH THE WORKER (1955)
MAY 3	ST. PHILIP AND ST. JAMES Son of Alphaeus. d 62 related by blood to Jesus
MAY 14	ST. MATTHIAS, APOSTLE
MAY 27	ST. AUGUSTINE OF CANTERBURY (596) May 26?
MAY 31	THE VISITATION OF THE BLESSED VIRGIN MARY (1263)
JUN 9	ST. COLUMBA
JUN 11	ST. BARNABAS, APOSTLE
JUN 24	BIRTH OF JOHN THE BAPTIST
JUN 27	ST. CYRIL OF ALEXANDRIA 370-444
JUN 29	SAINTS PETER AND PAUL, APOSTLES
JUL 3	ST. THOMAS, APOSTLE
JUL 22	ST. MARY MAGDALENE – "Equal to the Apostles" - Eastern Church
JUL 23	ST. BRIDGET OF SWEDEN 1303-1373
JUL 25	ST. JAMES, APOSTLE Son of Zebedee
AUG 6	THE TRANSFIGURATION OF THE LORD
AUG 8	ST. DOMINIC
AUG 15	THE ASSUMPTION OF THE BLESSED VIRGIN MARY
AUG 22	THE QUEENSHIP OF MARY
AUG 23	ST. ROSE OF LIMA 1586-1617 "We cannot obtain grace unless we suffer affliction"
AUG 24	ST. BARTHOLOMEW, APOSTLE
AUG 27	ST. MONICA
AUG 28	ST. AUGUSTINE OF HIPPO 354-430
AUG 29	THE BEHEADING OF JOHN THE BAPTIST
SEP 3	POPE GREGORY THE GREAT, 'SERVANT OF THE SERVANTS OF GOD'
SEP 8	BIRTH OF THE BLESSED VIRGIN MARY
SEP 13	ST. JOHN CHRYSOSTOM
SEP 14	TRIUMPH OF THE HOLY CROSS
SEP 15	OUR LADY OF SORROWS
SEP 21	ST. MATTHEW, APOSTLE AND EVANGELIST
SEP 29	ST. MICHAEL, ST. GABRIEL AND ST. RAPHAEL, ARCHANGELS
OCT 4	ST. FRANCIS OF ASSISI
OCT 7	OUR LADY OF THE ROSARY (Lepanto victory)
OCT 18	ST. LUKE, EVANGELIST
OCT 28	ST. SIMON AND ST. JUDE, APOSTLES
NOV 1	ALL SAINTS
NOV 2	ALL SOULS

JAN 4 St. Elizabeth Ann Seton 1774-1821 First native born American to be canonized

Jan 17. St. Anthony 251-356

Feb 14 St. Cyril & St. Methodius 827-869 826-884

Mar 21 St Benedict 480-547

Apr 21 St. Anselm

May 30 Feast of the Immaculate Heart of Mary

July 16 Our Lady of Mount Carmel 1292

Sept 12 Feast of the Holy Name of Mary

Oct 13 Our Lady of Fatima 1917

NOV 15	ST. ALBERT THE GREAT
NOV 21	THE PRESENTATION OF THE BLESSED VIRGIN MARY
NOV 30	ST. ANDREW, APOSTLE
DEC 6	ST. NICHOLAS
DEC 8	THE IMMACULATE CONCEPTION OF THE BLESSED VIRGIN MARY (1854)
DEC 13	ST. LUCY
DEC 14	ST. JOHN OF THE CROSS
DEC 25	THE INCARNATION OF THE LORD
DEC 26	ST. STEPHEN, PROTOMARTYR
DEC 27	ST. JOHN, APOSTLE AND EVANGELIST
DEC 28	THE HOLY INNOCENTS, MARTYRS
DEC 29	ST. THOMAS BECKET
DEC 31	THE HOLY NAME OF JESUS

FEASTS OF DEVOTION OF OUR LORD page 169

CORPUS CHRISTI (1264)
MOST HOLY TRINITY (1334)
THE SACRED HEART (1856)
THE HOLY FAMILY (1921) Sunday within the octave of Christmas
CHRIST THE KING Sunday before Advent

FEASTS OF OUR LADY AND THE HOLY ANGELS

JAN 1 SOLEMNITY OF MARY
MAY 31 THE VISITATION
AUG 15 THE ASSUMPTION
AUG 22 QUEENSHIP OF MARY
SEP 8 BIRTH OF MARY
SEP 15 OUR LADY OF SORROWS
OCT 7 OUR LADY OF THE ROSARY
NOV 21 THE PRESENTATION OF MARY
DEC 8 THE IMMACULATE CONCEPTION

JOINT FEASTS

FEB 2 THE PRESENTATION
MAR 25 THE ANNUNCIATION

CORPUS CHRISTI
3 WEEKS AFTER ASCENSION (A B)
61 Days after Easter

12/12/89, 8:00 a.m.

This morning winter was in full bloom (so far as is possible in California). The temperature dropped to the low twenties, the bird bath was frozen solid and a thick frost whitened the orchard. The frost on the shingles created the illusion of snow on the roof and the junipers and cedars bending under the weight of the heavy frost conformed to the greeting card shapes of trees burdened with snow. A thick fog settled all around shrinking the world into the intimacy of a cozy room. The lagoon loomed through the fog dark, frozen, and bleak. Last year's solitary egret whose whiteness stood in stark contrast to the December darkness was missing this year. But even in the absence of that luminous symbol of life, the scene paradoxically radiated a strange warmth and coziness. Some invisible presence suffused the world with peace. How strange this affinity of closure with completeness, of solitude with joy.

I think we have never understood the true nature of winter. We glimpse its inert beauties and briefly behold its transforming spirit, but its real power eludes us. What we glimpse of winter we attempt to subsume with our cultural symbols, but we only capture a spoonful of the ocean. To recognize the warmth in winter's bleakness and the joyfulness in its solitude requires a different kind of sensitivity than that inculcated by our urban culture. It requires the sensitivity of Mila Repa sitting alone under the stars naked on a lofty glacier. Or the sensitivity of the white egret standing alone on one leg enshrouded by fog in the frozen lagoon.