

Andrew Kennedy

The Cosmology
of People

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The kinship of
coincidence

Andrew Kennedy

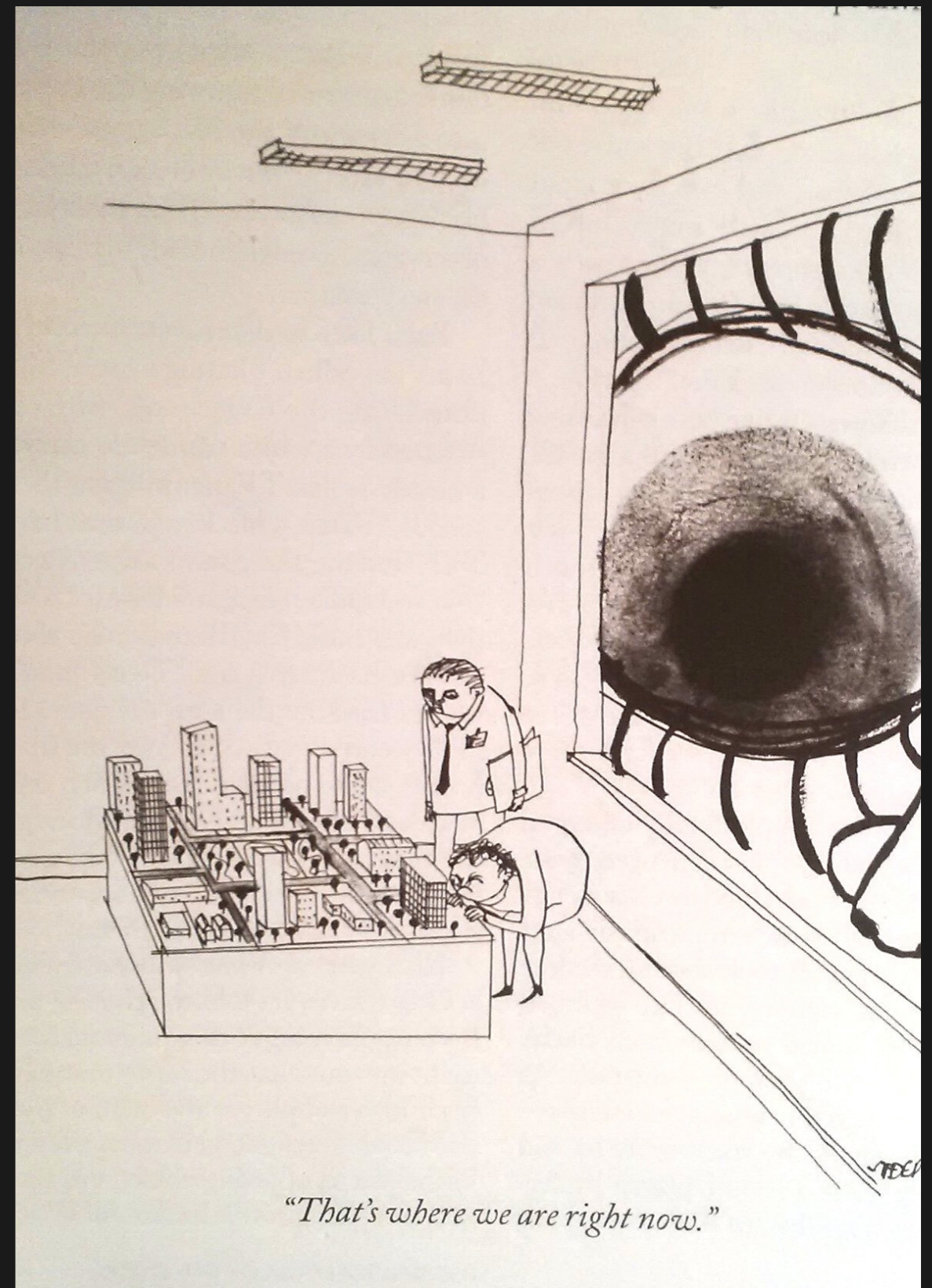
The Cosmology
of People

and the time travel solution

An Astrobiological Proposal

ARE HUMANS ESPECIALLY FAVOURED BY VIRTUE OF THEIR EXISTENCE?

- ▶ Hard to escape the comfort notion that this universe is designed for us.
- ▶ It bedevilled the thinking of medieval religion
- ▶ It bedevils the Anthropic reasoning of today.
- ▶ It is a psychological problem which distorts talk about understanding the Universe.



THE ANTHROPIC PRINCIPLES

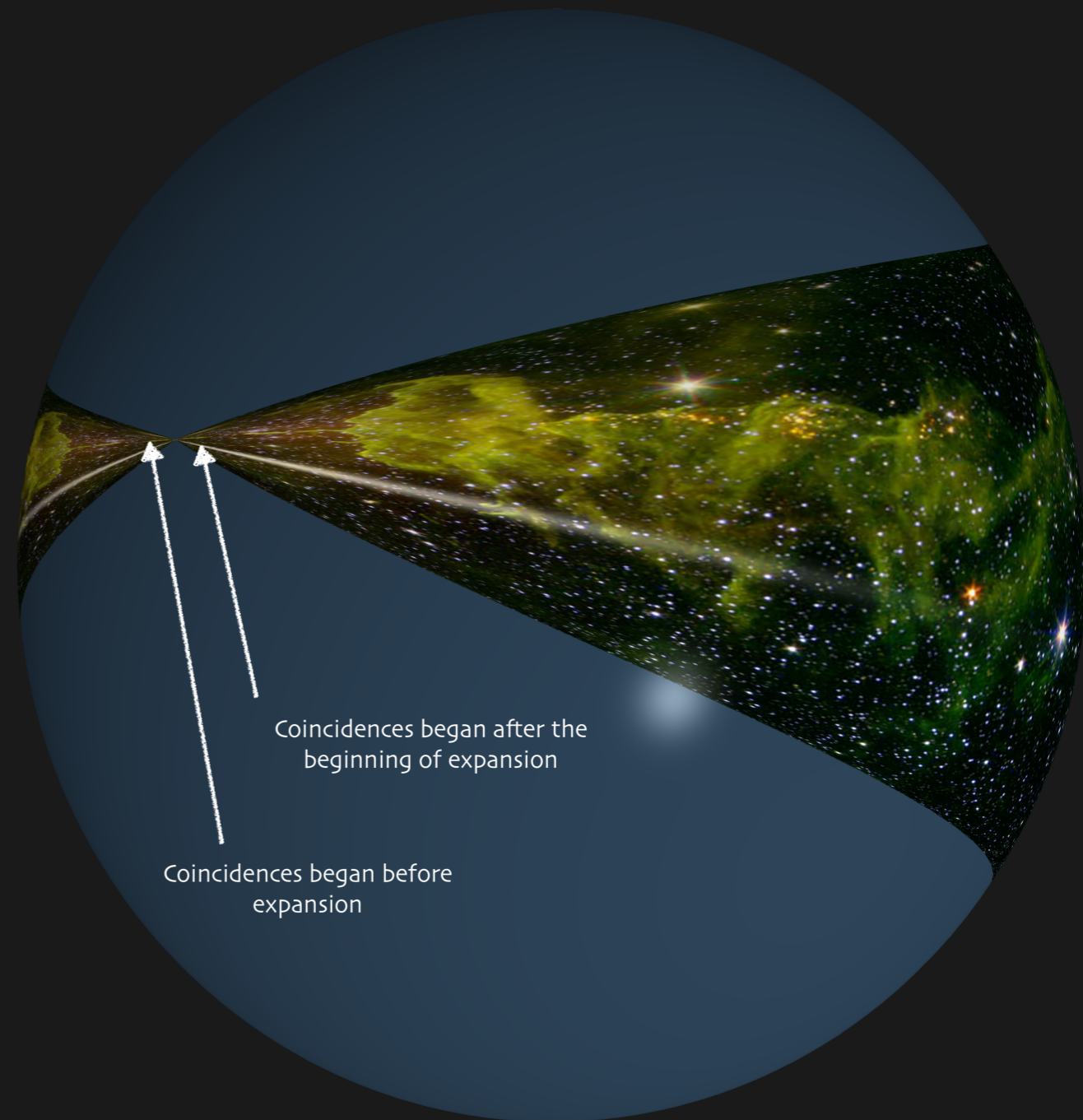
- ▶ The matter of the fine tuning of the Cosmological Constants.
 - ▶ A set of dimensionless ratios appear to have forced a certain kind of universe.
 - ▶ Eddington and Dirac are principally responsible for the direction this discussion took.
 - ▶ Strong and weak versions of the meaning of these coincidences
 - ▶ It is our existence that is used to imply other existences.

Dirac said in his abstract for his paper on the Cosmological Constants in 1935.

THE fundamental constants of physics, such as c the velocity of light, h Planck's constant, e the charge and m mass of the electron, and so on, provide for us a set of absolute units for measurement of distance, time, mass, etc. There are, however, more of these constants than are necessary for this purpose, with the result that certain dimensionless numbers can be constructed from them. The significance of these numbers has excited much interest in recent times, and Eddington has set up a theory for calculating each of them purely deductively. Eddington's arguments are not always rigorous, and, while they give one the feeling that they are probably substantially correct in the case of the smaller numbers (the reciprocal fine-structure constant hc/e^2 and the ratio of the mass of the proton to that of the electron), the larger numbers, namely the ratio of the electric to the gravitational force between electron and proton, which is about 10^{39} , and the ratio of the mass of the universe to the mass of the proton, which is about 10^{78} , are so enormous as to make one think that some entirely different type of explanation is needed for them.

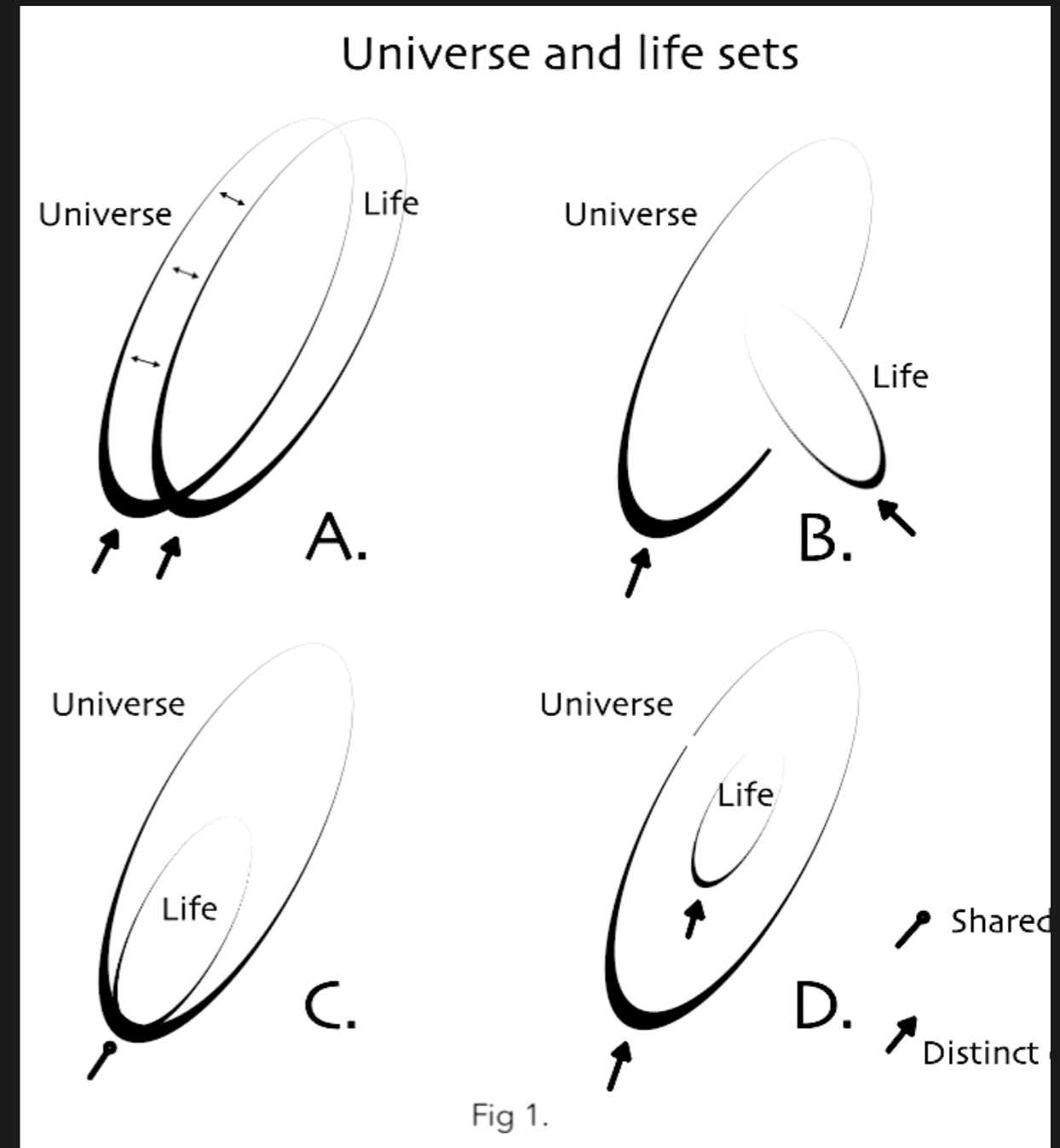
TWO ANTHROPIC PRINCIPLES

- ▶ Strong Anthropic Principle
 - ▶ The parameters out of which the universe of energy and matter is constructed came together deliberately before the universe began in order to create humans
 - ▶ Intelligent Design or simulation arguments
- ▶ The Weak Anthropic Principle
 - ▶ The sets of parameters values occurred after the Planck time and during the expansion. At least one set created life but there are others.
 - ▶ Implied by Eternal Chaotic Inflation
 - ▶ The Principle of Mediocrity
 - ▶ If random conditions produce sets of objects then the chances are that you will observe the most numerous arrangement of the set. Therefore humans are not special or privileged IF sets cluster around a mean.



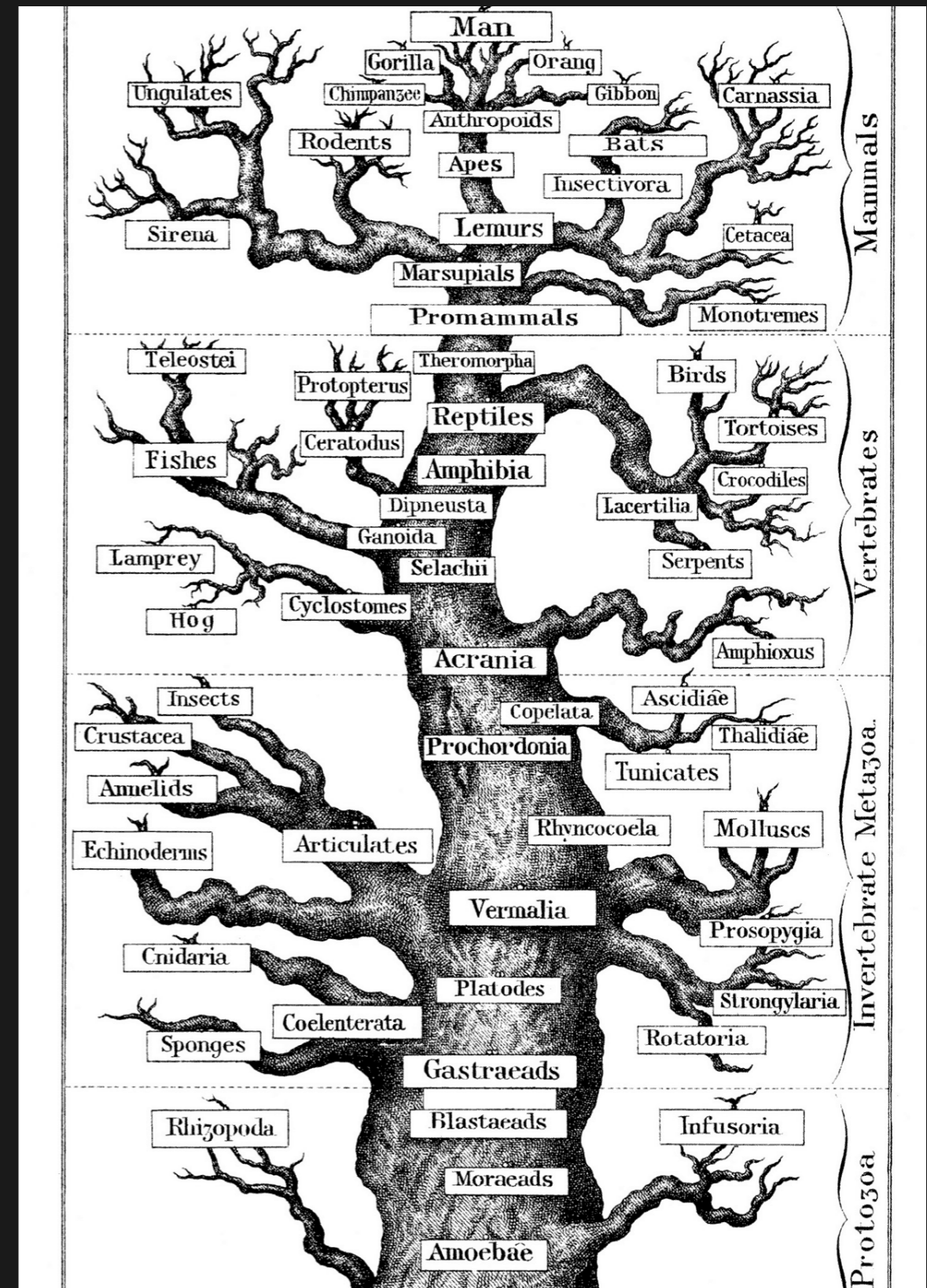
DIFFERENT WAYS OF THINKING ABOUT LIFE IN A MATERIAL UNIVERSE

- ▶ A. Overlap
- ▶ B. Interpenetration
- ▶ C. Conjunction
- ▶ D. Predisposition
- ▶ Is life a natural consequence of matter? If not then dualism exists.



EVOLUTION FROM COINCIDENCE

- ▶ Does life follow sequentially from matter?
- ▶ Contingency
 - ▶ Re-run evolution and completely different somatic results occur. No convergence.
- ▶ Type 1 - Gothic
 - ▶ Accidents over which there is no control or predictable result. Overall sum neutral and for which fitness does not contribute. Convergence is permitted
- ▶ Type 2 - Baroque creativity
 - ▶ Darwinian success where internal changes to the heritable components allow the organism to profit from the coincidences.
 - ▶ However the rate of speciation is slow ≈ 2 million years per species. This implies diversity.
 - ▶ Acceleration as internal mapping with the external increases.
- ▶ Evolution produces organisms that can profit from the experiential unpredictable events -the type 2s - not simply the random, the contingent.
- ▶ Life reproduces its mutations: Shklovskii, I. S.

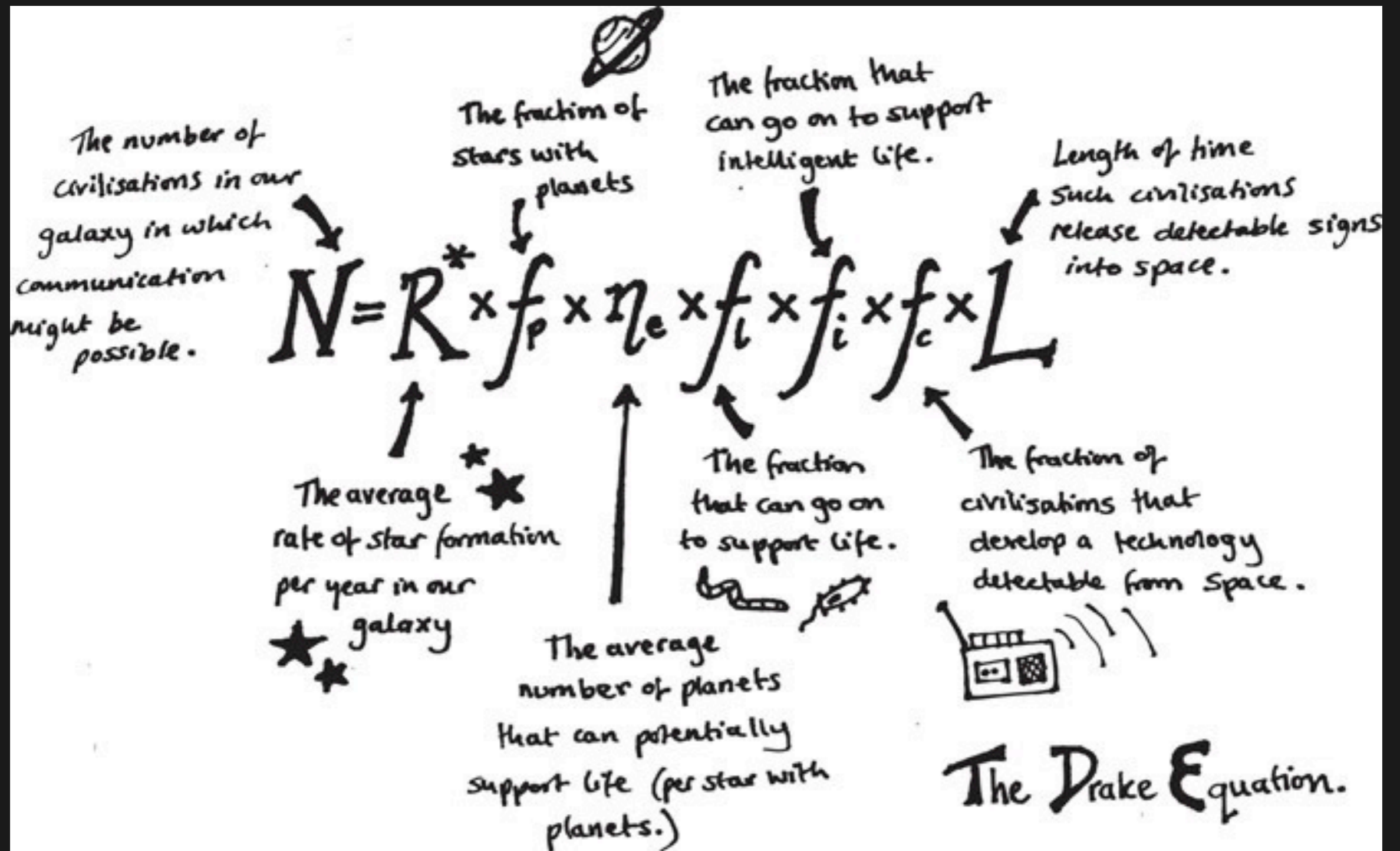


FERMI PARADOX

- ▶ "Time is an illusion. Lunch time doubly so." Ford Prefect
- ▶ If life is a natural consequence of matter, advanced life should be everywhere. So *where is everyone?*



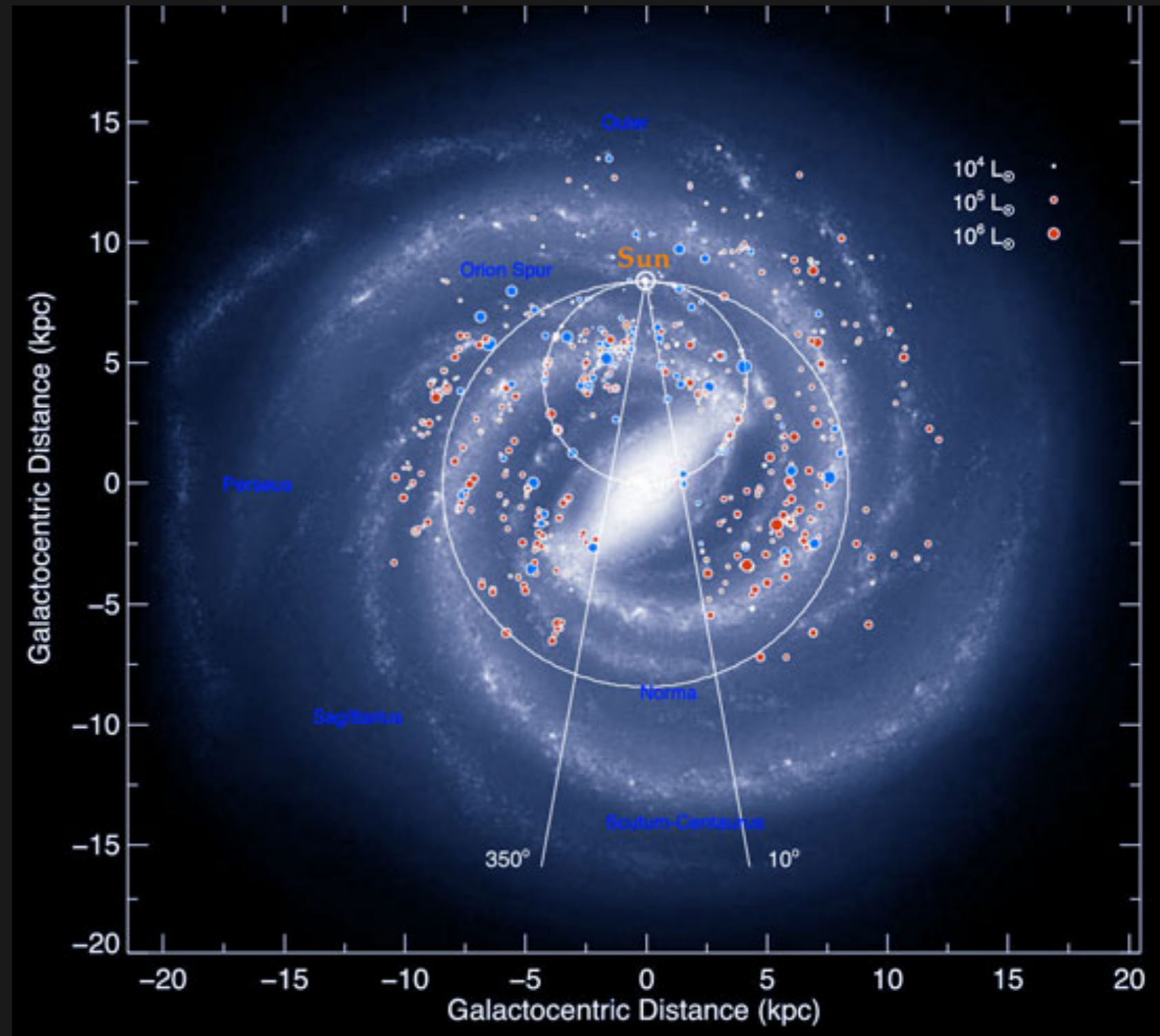
THE DRAKE EQUATION



acknowledgement: markshirleyblog

THE DRAKE EQUATION - 1ST THREE PARAMETERS

**OUR GALAXY -
AT LEAST 100 BILLION
STARS -
AT LEAST 100 BILLION
PLANETS -**



Credit: Urquhart JS, et al.; Robert Hurt, the Spitzer Science Center; Robert Benjamin

IS LIFE EVERYWHERE?

- ▶ Volume of our galaxy, say a disk of 50,000 light year radius and 1000 light years thick gives $\approx 76 \times 10^{11}$ light years³
- ▶ There are a minimum of 1×10^{11} planetary systems
- ▶ approximate maximum separation of planets of around 76 light years.
- ▶ Within 76 light years of Earth we have discovered 25 planets within the goldilocks zone of their star and thus potentially habitable.
- ▶ Even at 1/10 the speed of light this is only a maximum trip of 760 years.
- ▶ At a growth in velocity rate proportional to $T^{1/2}$ this could be reached after only 1,778 years of industrial growth.

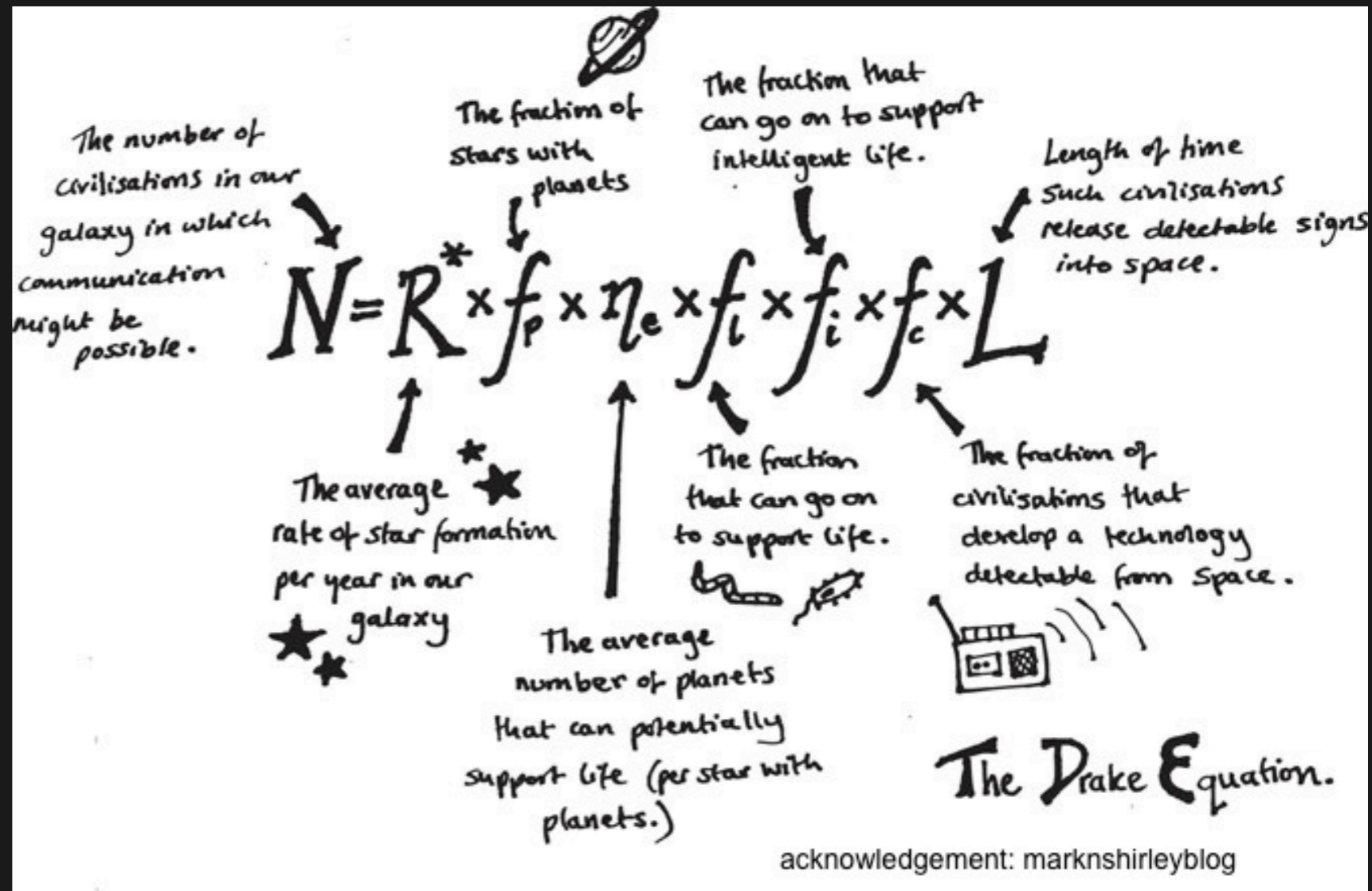
THE DRAKE EQUATION - LAST FOUR PARAMETERS

WITH A HUNDRED BILLION PLANETS, THESE LAST FOUR PARAMETERS CAN STILL BE VERY SMALL TO REDUCE N, TO A SMALL NUMBER.

WE CAN ONLY GUESS THE FRACTION OF PLANETS THAT MAY HARBOUR LIFE.

EVEN IF IT IS VERY SMALL THE KEY PARAMETER HERE IS L, THE LIFETIMES OF CIVILISATIONS.

FROM THE EVIDENCE OF OUR OWN EXPERIENCE, L COULD BE VERY SHORT, NO MORE THAN A FEW HUNDRED YEARS.



CIVILISATION LIFETIMES ARE SHORT BUT MANY ARISE

- ▶ Even after only 300 years of industrialisation, the lifetime of Humanity is looking shaky.
- ▶ Perhaps no advanced civilisation can last. Anthropocene
- ▶ Maybe there are many occurrences of civilisations on each planet.
- ▶ Could there be other advanced civilisations occurring here on Earth?



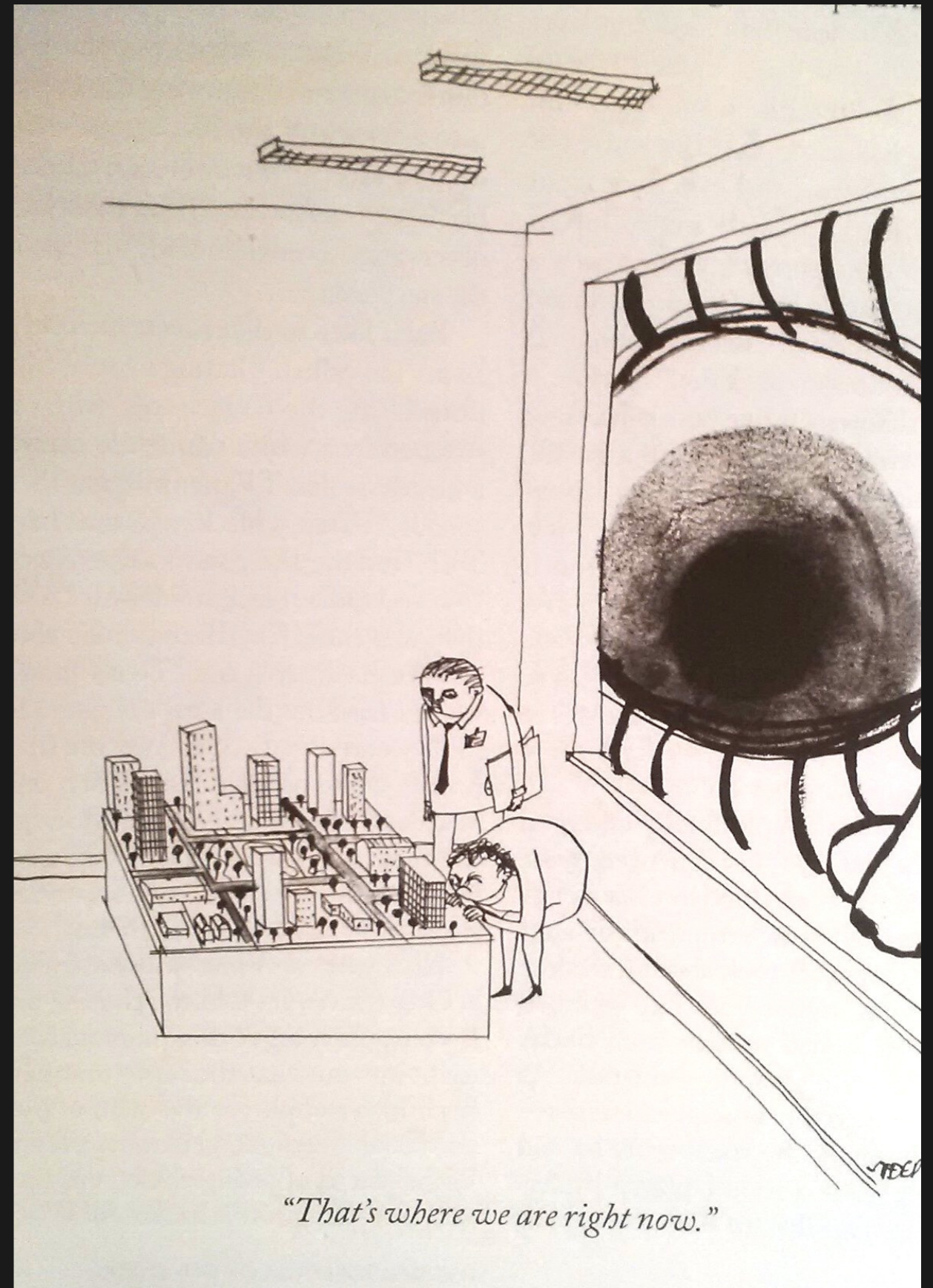
THE SILURIAN HYPOTHESIS

- ▶ Frank and Schmidt decided to analyse seriously the possibility of whether an ancient version of human civilisation could have arisen and not appear in the historical record. i.e the term f_c , the number of communicating civilisations in the Drake equation is > 1
- ▶ Consider: The age of the Dinosaurs lasted 65 million years and they were spread all over the planet. Today we have only a few thousand fossil skeletons on which are understanding of them is based.
- ▶ The Human technological layer of the Anthropocene age comprises only a few hundred years of activity (compared with 400 million years of complex life). Urbanisation occupies only 1% < of the Earth's surface. Compressed into rock and completely weathered into mineral this layer would be hard to detect.
- ▶ These and many other reasons suggest that even if there are a few occasions of early civilisations arising on Earth, evidence for their existence could be improbably hard to find, though not impossible.
- ▶ Leading to the conclusion that civilisations are either non-existent or live very short lives and leave little trace.
- ▶ This is worrying close to our own experience.



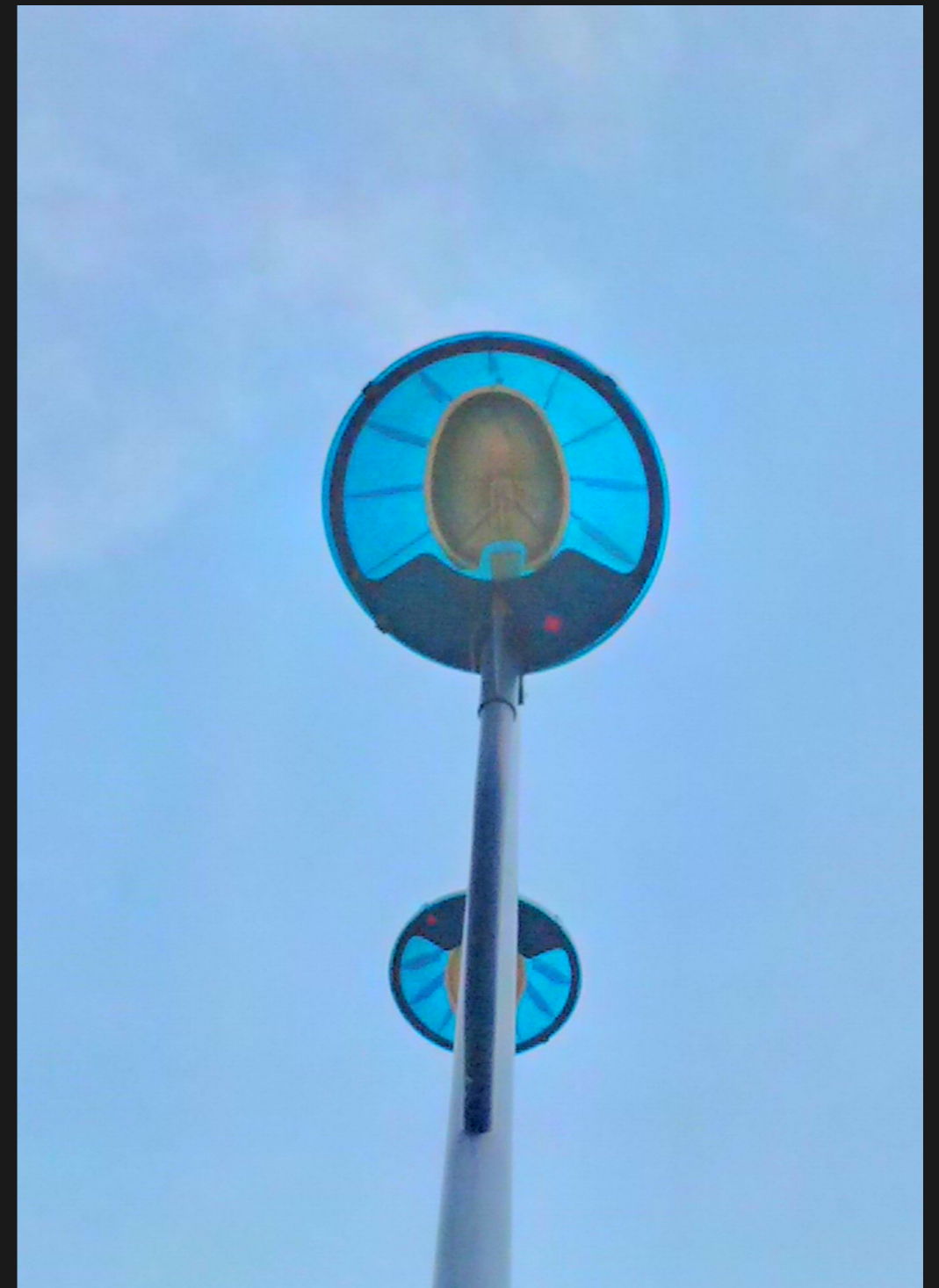
ANTHROPIC PRINCIPLES AND ONTOLOGY

- ▶ Coincidences are proof that life is not simply sequential steps in a world of matter.
- ▶ Maybe they prove a simulation.



HUMANS COINCIDENTAL NARRATIVE LEVEL

- ▶ Planetary situation
- ▶ Development aids
- ▶ More than survivor bias
- ▶ More than Goldilocks zone
- ▶ More than moon stability to earth
- ▶ Herbarium
- ▶ Helpful even without coevolution
- ▶ Hybrid grasses
- ▶ Surface metals and phosphorous
- ▶ Meteorites and comets
- ▶ Supportive diversity may either be rare for emerging life or too much of an accelerant
- ▶ Mars and Venus



COINCIDENCE IN MOLECULAR BEHAVIOUR

- ▶ Hydrogen Bonding

- ▶ Water

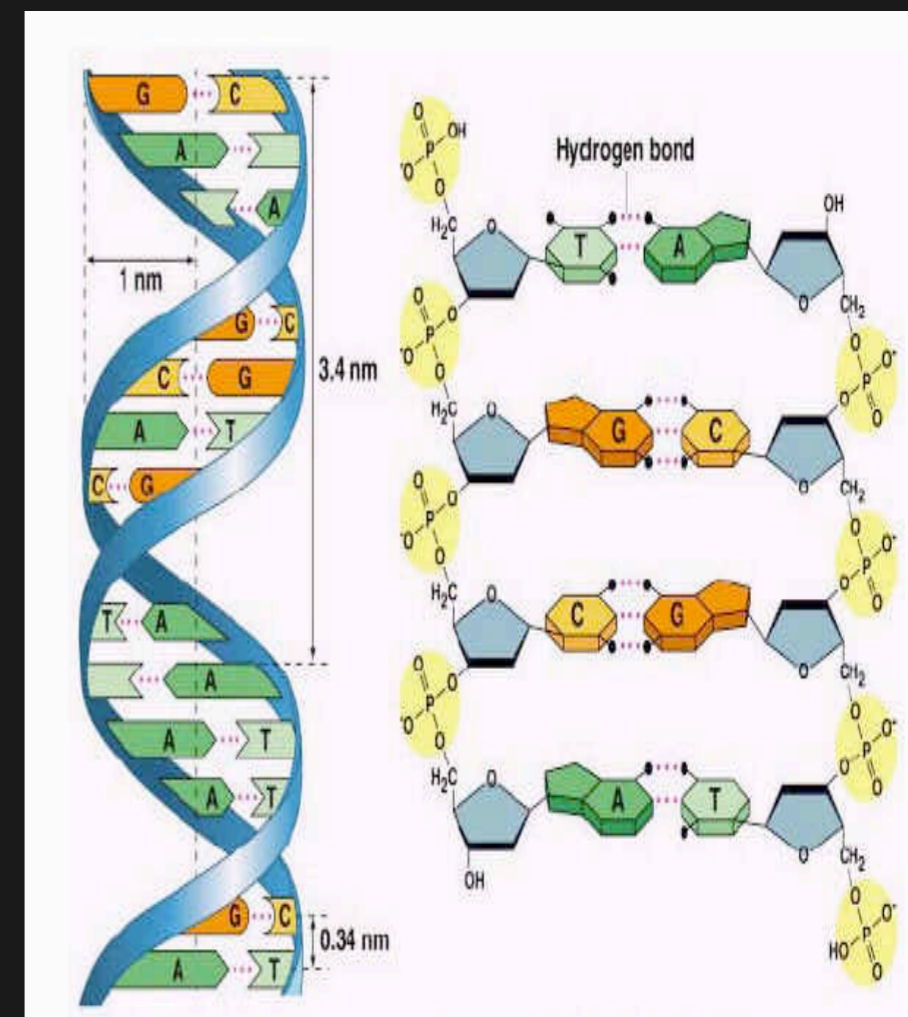
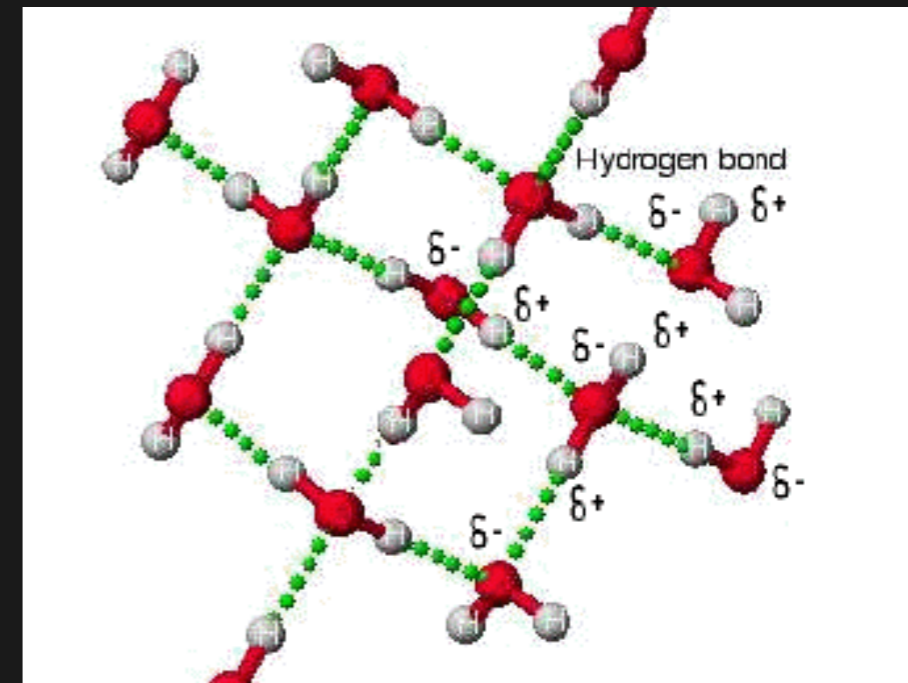
- ▶ Not simply the distorted charge distribution but the angle of the oxygen bonds at approx 107° which enables the ability to dissolve a large number of different molecules, and not turn into a crystal.

- ▶ DNA

- ▶ Works because not only because of Hydrogen bonding but also because of the peculiarities of phosphorous

- ▶ Within Proteins

- ▶ Allow for complicated 3-D shape where molecular chains can double back on themselves.
 - ▶ Allows for add-ons or 'decorations' to characterise the protein without changing its basic shape.
 - ▶ e.g in brain cells



PREVIOUS IDEAS ABOUT COINCIDENCE

- ▶ Paul Kammerer
 - ▶ Law of the Series
 - ▶ Grouping of coincidences reveals underlying reality but without any idea of what that reality may be.
- ▶ Carl Jung
 - ▶ Synchronicity
 - ▶ underlying spiritual unity
 - ▶ coincidence has no innate causal action but merely represents a hidden and 'higher' state of creation.
- ▶ Klaus Conrad
 - ▶ Apophenia
 - ▶ A form of confirmation bias.
 - ▶ Coincidences of similarity arise only in perceptions and where the brain is more alert to examples of what it already knows and understands.



WHAT DO WE MEAN BY COINCIDENCE?

- ▶ The meeting of world-lines: the separately developing probability streams or causal chains
 - ▶ 3 Kinds of Coincidence
 - ▶ Contingent
 - ▶ simple, random, ubiquitous
 - ▶ Gothic - Type 1 1N_c
 - ▶ Repetition or re-capitulation of information previously exchanged
 - ▶ Unpredictable, non-linear but Bayesian
 - ▶ Usually biphasic
 - ▶ Baroque - Type 2 2N_c
 - ▶ Unpredictable in principle
 - ▶ Re-enforcing of information exchanged
 - ▶ costless
 - ▶ Triphasic +



COINCIDENCE AND ORGANISATION

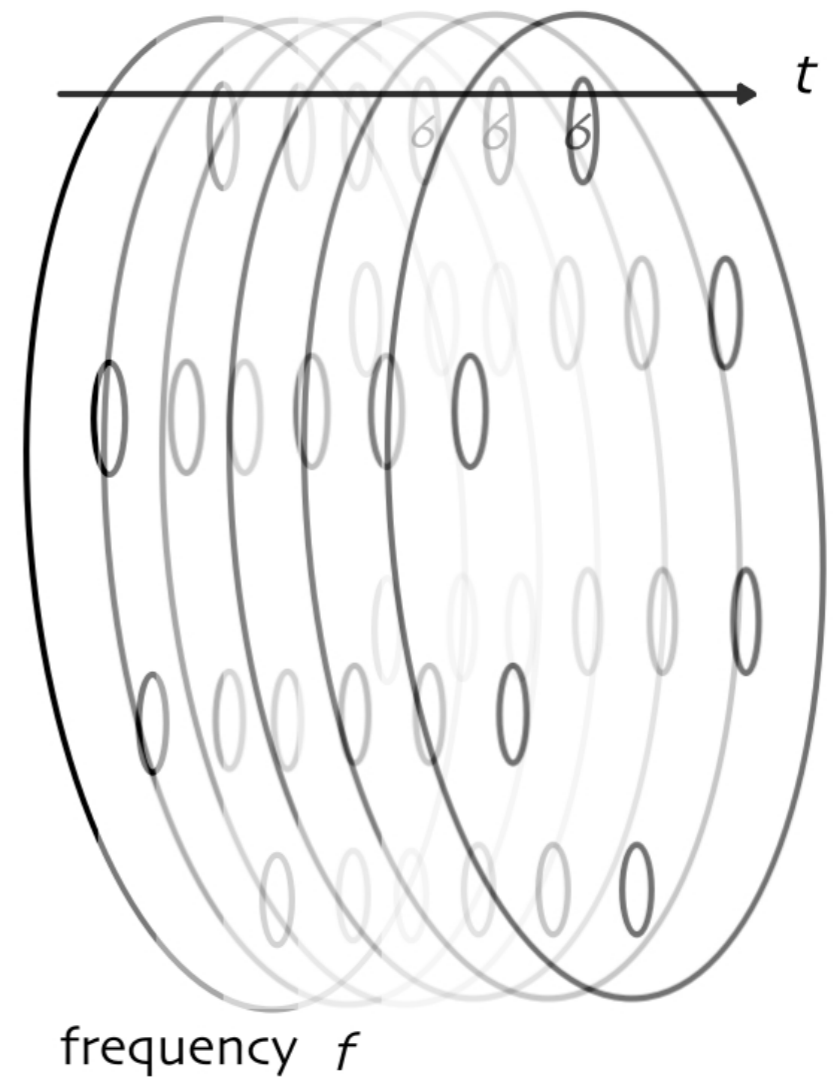
- ▶ The coincidence marked here may not be the result of chain of links. It could simply be overlap. Coincidence means there is no equilibrium. That there remains some dynamism without a gain in entropy.
- ▶ Difference to self-assembly and self organisation which suggests isolation from other systems and a search for equilibrium. Coincidence is anti-isolation. It's self projection into the future without thermodynamic loss. Coincidence means there is no equilibrium possible.



DICE TABLE UNIVERSE

- ▶ With six tables in a circle there's a chance of at least one occurrence of two similar faces turning up side by side (given any face, the chance that the next is the same is approximately $1/6$. In fact it's a little bit less because the last throw in serial throw always lies between two tables and so has a $1/3$ chance of agreeing with at least one table it sits between. This is avoided with simultaneous throws).
- ▶ Let that first pair define our neighbouring tables. The chances of the same double appearing again on these same tables on the next set of throws will be $1/6$ for the first table and $1/6$ for the next = $1/36$; almost 3% - not very likely. If that coincidence did show up on your six tables and continue to show up, again you would very quickly suspect that something other than probability was affecting the dice.

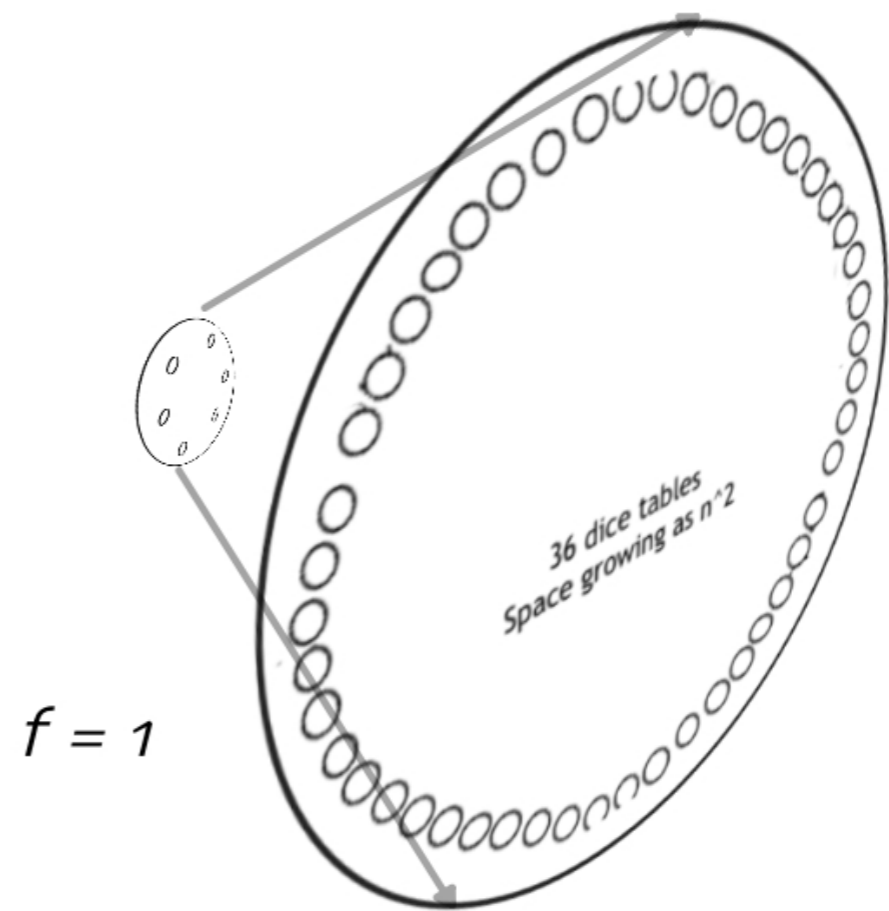
Time dependent occurrences



SPACE DEPENDENT PROBABILITY

- ▶ With more tables, say, 36, the likelihood of the same neighbouring double occurring returns close to certainty. As long as the number of tables (throws) has increased by the time you throw again, the continuing coincidence doesn't call into question the natural law of probability that governs each dice throw
- ▶ This case is similar to the weak anthropic scenario. But with one proviso: the gaming room universe has to grow, and in advance of the coincidence, in order that the probability of the outcomes between each table are conserved, and thus maintaining the validity or consistency of the values.
 - ▶ rate of growth proportional to (number of tables)²
- ▶ Thus the numbers of tables is directly proportional to the number of throws, in an honest universe.
- ▶ In an infinite universe coincidental repetitions should outnumber non-coincidental events.

Expansion of probability volume



CLOCKS

- ▶ Setting the clock
 - ▶ Stopped clock matching the actual time on re-start, twice.
- ▶ No method of calculating the probability of these events
 - ▶ Yet fundamental to the human narrative because of consciousness



CHILE - A RARE MEETING

- ▶ La Serena

- ▶ Actually happens to people all the time all over the world.



PETER AND THE COINCIDENCE OF MIND

▶ The Japanese Guidebook



▶ Japanese guide book

▶ Page about Seville



PETER

- ▶ Japanese guide book
 - ▶ Page about Seville
 - ▶ La Giralda
 - ▶ Anything else?

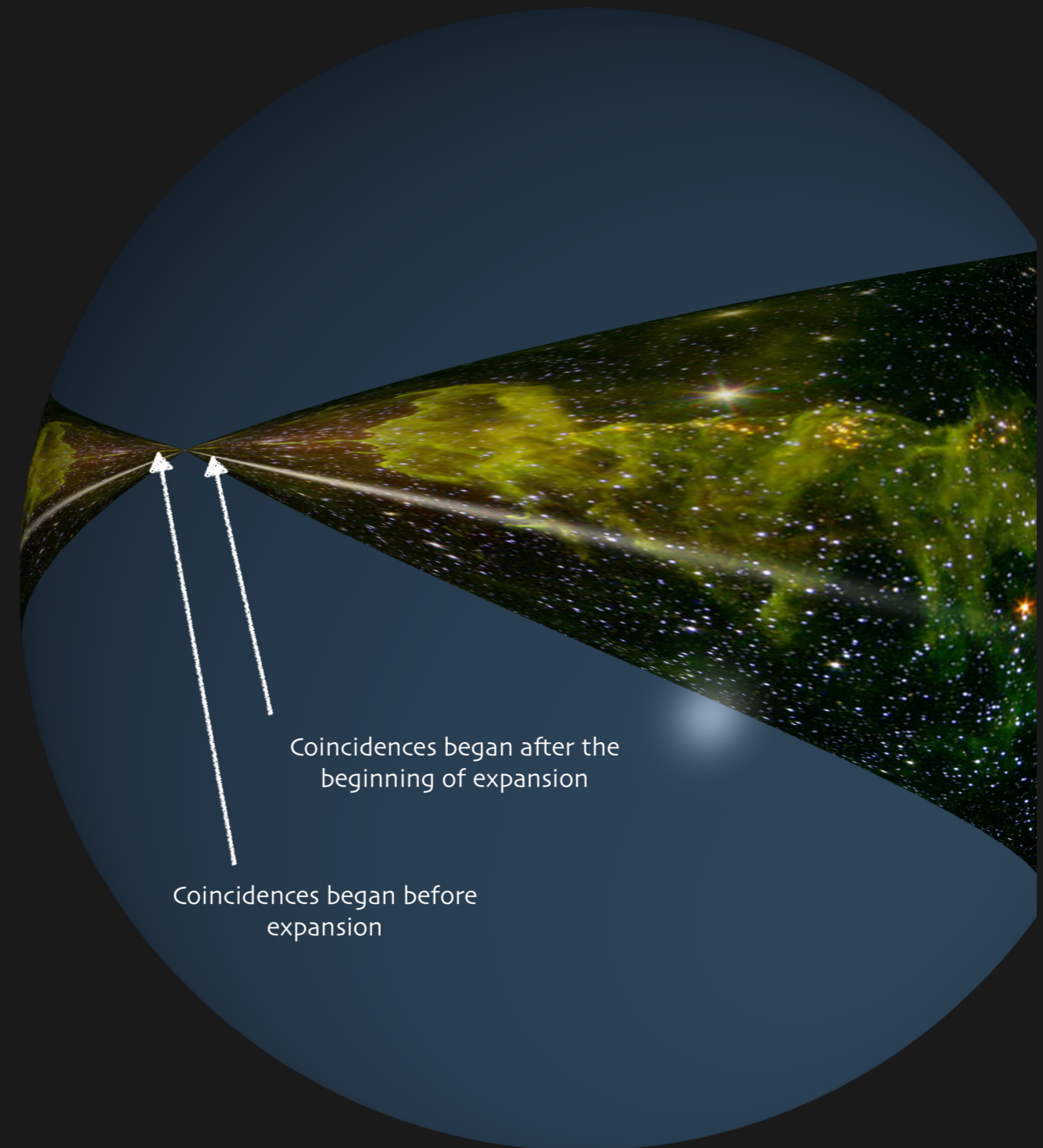
Peter



-
- ▶ *Coincidence is God's way of staying anonymous.*
Einstein

COINCIDENCE RE-CAP

- ▶ I want to suggest that coincidence is an actual property of this universe not simply the result of the constants that characterise it, and pervades it through all levels of organisation on a continuous basis.
 - ▶ Affects causality, for example in:-
 - ▶ Subatomic behaviour
 - ▶ measurements
 - ▶ Gravitation
 - ▶ Inverse Distributions
 - ▶ Molecular Behaviour
 - ▶ Biochemical
 - ▶ Evolution
 - ▶ Selection
 - ▶ The Human Narrative
 - ▶ Civilisation
 - ▶ The Existence of ETI



DEJA VU



BOLTZMANN BRAINS

- ▶ BB are a suggestion where in a universe at equilibrium some fluctuations in energy distribution could produce precisely that arrangement of matter that is consciousness.
- ▶ A mind could suddenly appear in a universe without having to go through messy evolution.
- ▶ The idea is flawed because thoughts are movements.
- ▶ But what are we to make of the sudden savant syndrome.



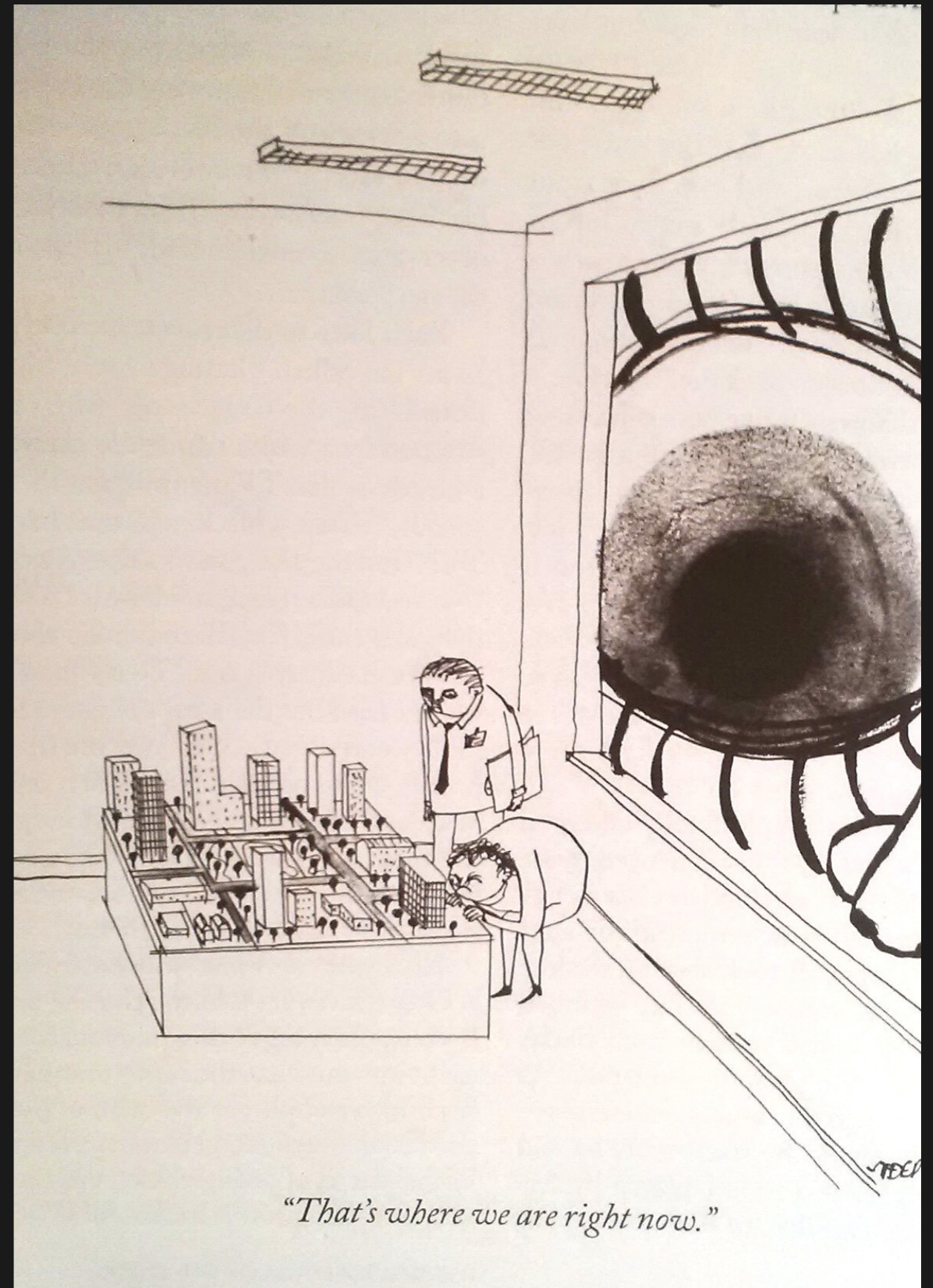
THE SUDDEN SAVANT

- ▶ Studied by the psychologist Darold Treffert.
- ▶ Sudden acquisitions of highly complex skills
- ▶ Knowledge acquired without raising entropy or expending energy.
- ▶ Minds cannot be fully material in the present since they access a complexity not available in the present
- ▶ Minds connect with the future.
- ▶ Minds may be time travel.
- ▶ Remembering is going back in time.
- ▶ Prediction is going forward in time.



SELF AWARENESS

- ▶ The I(eye) of self (Dennett and Hofstadter).
- ▶ Maybe it proves a simulation.



DARYL BEM

- ▶ Studies in precognition 2000-2015
- ▶ People seem to know stuff they only get to know overtly in the future. Or become aroused before they are shown a stimulus.
- ▶ Criticised but results appear to stand up.
- ▶ Bayes theorem cannot account for predictive decisions because it relies on past consistencies.



Location

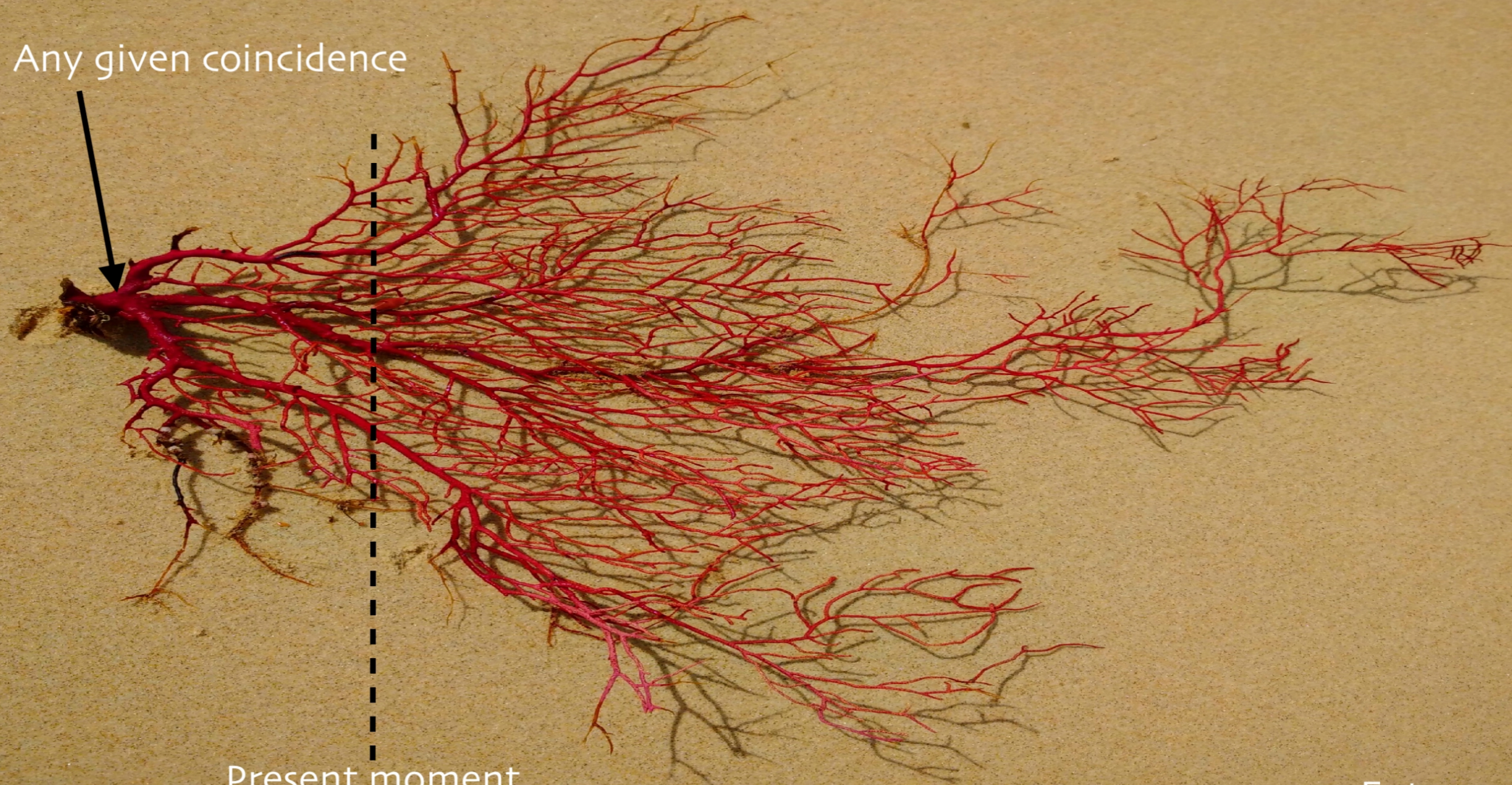
The Kinship of Coincidence

Any given coincidence

Present moment

Future

Time



END

WHY DOES THIS MATTER?

- ▶ Find out about the future or if we really are living in a simulation
- ▶ Learn what leads to positive amplification and what does not.
- ▶ Interstellar travel is travel back in time if we cannot see forward
- ▶ At 1/10 the speed of light, processing delays are up to 5%.
- ▶ Poor decision-making is the result of high speeds unless we can make use of premonitions.

