



# laetus in praesens

Alternative view of segmented documents via Kairos

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24 June 2024 | Draft

## Memorable Configuration of Psychosocial "Vitamins", "Amino acids" and "Minerals"

### Cognitive implications in going sustainably sessile in anticipation of catastrophe

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#### Introduction

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## Introduction

In a period of increasing concern for health globally, exemplified by the new WHO *International Treaty on Pandemic Prevention, Preparedness and Response* (2024), there is a case for exploring insights offered by the basic dietary elements widely recognized as vital to biological well-being. By contrast, this exploration focuses on the possibility of psychosocial analogues to vitamins, amino acids and minerals as potentially basic to psychosocial health -- if only as metaphors enabling healthy comprehension. The justification for the exploration follows from the precision with which those **micronutrients** offer a focus to physical health in a society much challenged by "ill-health" -- understood metaphorically, as only too well-framed by multiple crises and the expectation of more to come.

Curiously unlike those of physical health, those of psychosocial health are variously framed by a variety of descriptors on which there is little consensus -- exemplified by the disorderly reference to human values, as frequently cited by leadership (*Values, Virtues and Sins of a Viable Democratic Civilization*, 2022). The terms evoked in political discourse could well be understood as so-called **weasel words**, embedded in "waffle" -- signifying everything and nothing.

This investigation follows from an earlier exploration into [sessility](#) as a cognitive condition into which many are forced, or find viable, in contrast to the busyness otherwise upheld as appropriate to psychosocial health (*Cognitive Implications of Going Strategically Sessile*, 2024). As described by *Wikipedia*: Sessility is the biological property of an organism describing its lack of a means of self-locomotion. Sessile organisms for which natural motility is absent are normally immobile. This is distinct from the botanical concept of sessility, which refers to an organism or biological structure attached directly by its base without a stalk. Sessile organisms can move via external forces (such as water currents), but are usually permanently attached to something.

The question addressed is how the decline of collective organization -- especially in the case of civilizations -- merits exploration in terms of radical [downsizing](#) and its implication for individuals. Whilst readily explored in terms of the rejection of "global" in favour of "local", it is the cognitive implications of "going sessile" which would seem to merit greater attention. A key to the viability of such a strategy is the array of elements enabling sustainable sessility, as potentially suggested by those on which so much focus is placed with respect to viable health.

Given the provocatively controversial nature of the exploration, the following argument makes explicit use of artificial intelligence in the form of [ChatGPT 4](#) and [Claude 3](#) (Opus variant). This approach is a further evolution of its exploration in earlier papers on related matters. In this respect, the role of such AI facilities as an "aggregator" of non-numeric information available on the web was previously noted (rather than as a "computer" of numeric data). In juxtaposing the responses from two AI facilities, the question is how to benefit from their contrasting capacity to articulate relevant responses through drawing together the vast resources by which they have been variously trained. Given the conventional role of panels of experts, such juxtaposition of responses frames the question of how many distinctively trained AIs could usefully have their responses juxtaposed in this manner?

Reservations regarding such use continue to be noted, both with regard to the questionable verbosity and style of responses, and what could be termed an undue degree of "algorithmic enthusiasm" for the relevance of the questions posed (*Eliciting integrative insight via ChatGPT*, 2024). Such enthusiasm could be readily caricatured as a form of "marketing ingratiation" detracting from the responses. Other styles of presentation could have been requested of the AI facilities. However it is the articulation of the responses to unusual questions which merits a degree of appreciation.

As an investigation of the value of AI in the reframing of controversial issues -- and despite the reservations -- this approach contrasts with the concerns currently expressed by many with regard to the dangers of AI. Those articulating such arguments seem themselves to make little use of AI and seldom highlight what valuable new approaches to knowledge and governance it may enable -- despite token acknowledgement of benefits (*AI for Good Global Summit*, 2023). This is tragically evident in the defensive neglect of its implications for future international, interdisciplinary and interfaith discourse -- none of which can be said to respond effectively to the current fragmentation of a civilization in crisis and the conflicts it engenders (*UN adopts first global artificial intelligence resolution*, Reuters, 22 March 2024; *World needs urgent political action to guide AI, pope tells G7*, Catholic Standard, 17 June 2024; *AI and the Holocaust: rewriting history?* UNESCO, 2024).

Potentially to be recognized as indicative of the psychosocial "nutrients" vital to the health of civilization, the status of the UN's Sustainable Development Goals could be recognized as suggesting an urgent indication of the need for AI:

None of the 17 goals, which include combating climate change and reducing inequality, is expected to be achieved by the UN's 2030 deadline. Only about 12% of the 169 underlying targets are likely to be met. (*The Sustainable Development Goals: can they be made smarter?* Nature, 17 June 2024).

As previously noted, a merit of the following approach is that readers can explore alternative articulations by repeating (or amending) the questions to the AI facilities to which they have access -- especially as those facilities become more sophisticated and have a wider access to relevant published research. A particular concern is with the biases introduced in framing the prompts used here -- readily challenged to the extent that they take the form of "[leading questions](#)".

In what follows, **a major bias is the configuration of elements relevant to psychosocial health and how they might be comprehended in a more coherent manner** -- and rendered memorable. The challenging relevance of widespread (in)comprehension is assumed to be fundamental to the limited uptake of the many remedial strategies conventionally proposed. Even with respect to physical health, few have the ability to recall the specifics of the array of vitamins, amino acids and minerals vital to their physical health -- however these may be effectively recognized by the human body in quest of appropriate nourishment. This deficiency would seem to be all the greater with respect to the elements fundamental to psychosocial health -- despite the assertions of leaders and experts in that regard (*Time for Provocative Mnemonic Aids to Systemic Connectivity?* 2018). Of relevance are the possibilities of reconciling the "headless hearts" to the "heartless heads" beyond the preoccupations of either.

The focus follows previous explorations of the matter (*Memetic Analogue to the 20 Amino Acids as vital to Psychosocial Life?* 2015; *Psychology of Sustainability*, 2002). From that perspective, a curious aspect of "going sessile" is suggested by the overly familiar experience of waiting (*Waiting as an Experience of Fundamental Significance*, 2018). This can be understood as related to the manner in which various forms of singularity are now anticipated or awaited (*Emerging Memetic Singularity in the Global Knowledge Society*, 2009). Of similar relevance are the mysterious dynamics fundamental to hopeful anticipation of enduring viability (*Paradoxes of Durable Peace, Heaven and a Sustainable Lifestyle*, 2023).

As in the previous experiments, the responses of ChatGPT are distinctively presented below in grayed areas, in parallel with those of Claude 3. **Given the length of the document to which the exchange gives rise, the form of presentation has itself been treated as an experiment** -- in anticipation of the future implication of AI into research documents. Web technology now enables the whole document to be held as a single "page" with only the "questions" to AI rendered immediately visible -- a facility developed in this case with the assistance of both ChatGPT and Claude 3.

This compact presentation facilitates readability and overview by reducing the apparent length of the complete document by 90%. However readers have the ability to toggle access to the individual AI "response" associated with each question -- and to hide it. This interactive facility (available in the [original](#)) is not available in the PDF forms of the document -- for which both questions and responses are necessarily visible in a necessarily lengthy presentation.

Show All AI Responses

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## Memorable mapping possibilities framed by the micronutrients of physical health?

This exploration was evoked by discovery of a paper detailing the possibility of configuring the set of 20 amino acids as a dodecahedron (V.A. Karasev, V.V. Luchinin and V.E. Stefanova, *Dodecahedron-based Model of Spatial Representation of the Canonical Set of Amino Acids*, *Proceedings of the International Conference. "Advances in Bioinformatics and its applications"*, World Scientific Publishing, 2005). The model in question is reproduced below left. Unrelated to that, such a possibility had been speculatively suggested in the animation below right (*Identifying 20 "amino acids" of a memetic code potentially vital to psychosocial life?* 2015). As in the earlier initiative, in that animation the amino acids are associated with the 20 vertices of a dodecahedron -- but morphing that form into an icosahedron as its dual -- where the amino acids are associated with the faces. The configuration from 2005 is further discussed below.

Indicative mapping of amino acids onto polyhedra	
Dodecahedron-based model of set of 20 amino acids	Morphing mapping of amino acids between dodecahedron (20 vertices) and icosahedron (20 faces)
Reproduced from V.A. Karasev, et al, <i>Dodecahedron-based Model</i> (2005)	Reproduced from <i>Identifying 20 "amino acids"</i> (2015)

As a mnemonic device, of interest is the possibility of associating the 12 vitamins with the faces of the dodecahedron -- or alternatively with the 12 vertices of the corresponding icosahedron.

**Question:** In considering the possibility of a mapping of "canonical" amino acids (20 not 21 or 22) onto a dodecahedron in relation to vitamins (12-14) and minerals (?) essential to life, there seem to be variations in the numbers in each case. Could you clarify how definitive are the advocated counts

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**Question:** There are various presentations of "12 vitamins" -- why might there be a missing 13th

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**Question:** The inquiry must necessarily distinguish between the health functions of 12 vitamins and those of 20 amino acids. How could this distinction be made with respect to psychosocial health -- and can you speculate on the correspondences as you have helpfully made for the vitamins. In psychosocial terms, and from a systemic viability perspective, how are "vitamins" then distinct from "amino acids"

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**Question:** You do not comment on what might be the most biologically indispensable minerals and those without which severe deficiency symptoms occur (that would reduce the number to 14) -- or what might be added to increase the count for mnemonic mapping purposes

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## Distinctive behaviours associated with psychosocial micronutrients

**Question:** The focus here is on the mnemonic mapping of potential psychosocial analogues to the vitamins, amino acids and minerals -- accepting the issues of variability of counts. With respect to a count of 12 vitamins, can you speculate on psychosocial functional equivalents -- given the manner in which the vitamins are presented for biological health

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**Question:** Reverting to the earlier speculation, the question is whether there is any 20-fold ordering of psychosocial functions which might indeed correspond in systemic terms to the array of amino acids -- given their fundamental biological function. A paper referring to this possibility is attached [[Identifying 20 "amino acids" of a memetic code potentially vital to psychosocial life?](#) 2015]

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**Question:** In the psychosocial case this frames the question of how an individual (or a collective) can "obtain" the vitamins -- defined as not being generated by the body. What might be considered the distinctive behaviours which enable them to be obtained

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**Question:** The attached paper notes the somewhat surprising preference for the 20-fold articulation of strategically-related initiatives [[Requisite 20-fold Articulation of Operative Insights? Checklist of web resources on 20 strategies, rules, methods and insights](#), 2018]. Could you speculate on their correspondence as psychosocial analogues to the set of amino acids

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**Question:** Having noted the use of 20-fold patterns for strategic articulations, any correspondence between biochemical and psychosocial functions could only be explored through [general systems theory](#) or for mnemonic purposes. With respect to such a spectrum of scales however, of particular interest is the identification of any 20-fold pattern of behavioural functions required for the viability and sustainability of the sessile condition (as previously discussed). Whilst a set of values might well be identifiable, it is a requisite variety of disparate behaviours (in a cybernetic sense) which would offer greater insight into the dynamics of a sessile condition.

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### **Ill-health as indicative of a systematic cognitive disconnect**

**Question:** A problematic feature of the response is its avoidance of the major challenge of ill-health -- whether of individuals physically, mentally or psychosocially -- and the implications for the health and viability of collectivities and civilizations. It is noteworthy that whilst it considered feasible to recognize "universally" the complementary sets of vitamins, amino acids and minerals vital to health, there is considerable confusion (if only with respect to terminology, in recognizing their psychosocial analogues -- and a seeming reluctance to doing so in a civilization in crisis. Could you comment on this "disconnect" with respect to global health

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**Question:** To what extent can that disconnect be attributed to the systematic conventional deprecation of traditional knowledge systems, as notably argued by Susantha Goonatilake (*Toward a Global Science: mining civilizational knowledge*, 1998) and Darrell Posey (*Cultural and Spiritual Values of Biodiversity: a complementary contribution to Global Biodiversity Assessment*, 1999). The cited resources could be understood as indicating articulations which address the lacunae in conventional frameworks of understanding.

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As noted previously, the strange challenge to comprehension of a triplicity is exemplified by the [Borromean rings](#) -- chosen as the [3D logo of the International Mathematical Union](#) and extensively discussed with regard to Dante's experience of paradise ([Borromean challenge to comprehension of any trinity?](#) 2018; [Beyond binary dialogue -- the subtle possibility of "Borromean intercourse"?](#) 2023)

**Question:** Could you comment on the seemingly "mysterious" nature of understanding the psychosocial

analogues to the triad (vitamins, amino acids, minerals) in the light of subtle insights into [Dante Alighieri's "three wheels"](#), as framed by Arielle Saiber and Aba Mbirika (*The Three Giri of Paradiso XXXIII, Dante Studies*, CXXXI, 2013)

*# Show/Hide AI response #*

## Engendering "psychosocial rocks" in response to psychosocial confinement

**Question:** Of interest with respect to sets of 12 or 20 options is the manner in which these numbers notably exceed those of the "magical number seven plus or minus two" (George Miller) as a constraint on short-term memory. This suggests the experiential value of larger sets to transcend the predictability (and boredom) associated with a smaller set. It would appear that 12 or 20 offer the possibility of surprise and (re)discovery. An insight is offered by the anecdotal use of a rock in the centre of a farm carp pond. Without the rock, the carp just stays unexercised in the centre; with the rock it has the illusion of being in a stream and can keep on swimming around it. Is there a need for "psychosocial rocks", as implied by the work of Ronald Atkin on q-analysis and circulation around "objects" and "holes"

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**Question:** A form of test for these considerations is the case of caged animals in zoos. I attach an early consideration of possibilities [*Primate Environmental Enrichment: automated reconfiguration of zooenclosures*, 2011]. With the advent of AI, of particular interest is how chimpanzees (for example) might interact with AI facilities to modify their environment -- with the AI trained to offer contrasting experiences consistent with your suggestions

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**Question:** In this exchange the relevance was noted to individuals in variously confined situations (prisoners, teenagers, hospice residents, etc) -- exemplified by caged animals (pets, zoos, etc). That response emphasizes (perhaps excessively) how the environment can be modified to that end when it is also of interest how the vitamins might be obtained through contrasting (complementary) rituals and routines (as for hermits or monastic inhabitants)

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**Question:** The response could be fruitfully confronted ("tested") by the rules of monastic institutions -- and their application -- to the extent that such contexts are understood as demonstrating viability and sustainability over extensive periods -- as well as demonstrating a form of sessility. Given the attitudes characteristic of teenagers, prisoners, and those confined to hospices -- if not to hermits -- it is not clear whether the behavioural options are appropriately framed. As with caged primates in zoos, how is engagement with disparate options enabled by re-discovery and surprise rather than by selection from a predictable menu of boring possibilities.

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**Question:** Reverting to the paper shared with you regarding the identification of a 20-fold ordering of psychosocial functions, it is the Buddhist pattern of kleshas or hindrances (and their positive correspondences) which is seemingly most suggestive of cognitive functions relating to viable sessility (although a 20-fold pattern is occasionally used for strategic initiatives). Could you speculate on how these might correspond in systemic terms to the functions associated with specific amino acids.

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**Question:** The [Inner Development Goals](#) (IDG) framework is currently organized in terms of 5 dimensions and 23 skills and qualities. As a conventional articulation of psychosocial "micronutrients", could you

comment on how the set of 23 might anticipate later convergence onto the traditional 20-fold Buddhist pattern that is a product of centuries of reflection, constitute a challenge to it, or be understood as a distinctive understanding of "micronutrients"

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**Question:** If engagement is elicited -- by the possibility of surprise and discovery of novelty -- through patterns of complexity significantly exceeding Miller's "magical number seven", consideration could of the array of patterns which are a feature of media entertainment clustered by George Polti as *The Thirty-Six Dramatic Situations*. This suggests that such a set may be of requisite variety to sustain the quest for surprise, both for the individual and the collective, as discussed in the attached paper [*Thirty-six Dramatic Situations faced by Global Governance?* 2022]

*# Show/Hide AI response #*

## **Polyhedral characteristics enabling comprehension and operational viability**

The case for use of memorable 3D configurations has been explored separately (*Identifying Polyhedra Enabling Memorable Strategic Mapping*, 2020). The correspondence of cognitive internalization with collective strategic articulation has also been considered (*Memorable Packing of Global Strategies in a Polyhedral Rosetta Stone*, 2023).

**Question:** A count of 12 vitamins enables use of the sides of a dodecahedron for mapping purposes -- or the vertices of its dual. With respect to the mineral count, use has previously been made of the 16-vertex "simplest torus" or its dual. But you imply that that count is never reduced to 14 -- which would offer related mapping possibilities

*# Show/Hide AI response #*

**Question:** With respect to any mapping for mnemonic purposes, and in seeking to use the most common polyhedra, could coherent use be made of the diagonals and internal links between vertices -- as in the case of the dodecahedron or its dual. What numbers do these offer

*# Show/Hide AI response #*

**Question:** This argument has noted the relevance of the dodecahedron/icosahedron to the mapping of 12 vitamins and 20 amino acids, but without considering the essential "minerals" for which various counts are proposed. Of potential relevance, especially for mnemonic purposes, is the possibility of assuming that count to be 15. This could prove especially appropriate given the magnum opus of Christopher Alexander (*The Nature of Order*, 2002-2004) informed by his work on *A Pattern Language* (1977). These later evoked his insights into a 15-fold pattern of "transformations" (*Harmony-Seeking Computations*, *International Journal for Unconventional Computing*, 5, 2009). With respect to any complementary mapping of 15 minerals, an approach to eliciting psychosocial transformational principles from design, a 15-fold pattern is especially characteristic of the icosahedron -- as discussed in the attached paper [*Harmony-Comprehension and Wholeness-Engendering*, 2010]. This frames a question with regard to the UN's especially unmemorable pattern of 17 Sustainable Development Goals -- as "minerals" -- and the manner in which they could be more appropriately configured.

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The potential relevance of the insights derived from Arthur Young's *Geometry of Meaning* (1978) are separately discussed (*Typology of 12 complementary strategies essential to sustainable development, Characteristics of phases in 12-phase learning / action cycles, Typology of 12 complementary dialogue modes essential to sustainable dialogue*).

**Question:** The work of Arthur Young (*Geometry of Meaning*, 1994), in the light of his insights into navigation of a helicopter, suggested a relationships between a 12-fold pattern of operations and insights regarding functions associated with the traditional polygonal representation of the zodiac in 2D -- reframed by Young as a [Rosetta Stone](#). Is there any trace of a relationship between the set of vitamins and that cyclic pattern, as discussed in the attached paper [[Memorable Packing of Global Strategies in a Polyhedral Rosetta Stone](#), 2023]

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In this context -- given the degree of perceived variability in the numbers of vitamins, amino acids and minerals -- there is a case for exploring the relevance to this "flexibility" in relation to the requirements of the strategic "resilience" acclaimed in relation to sustainability. Whilst polyhedral mappings imply a degree of rigidity inconsistent with such rigidity, it is surprising to note the widely acknowledged flexibility associated with corresponding polyhedral forms of tensional integrity ("[tensegrity](#)"), as discussed separately ([Eliciting Patterns of Global Consensus via Tensional Integrity](#), 2023). Such forms are renowned for their ability to recover dynamically from forms of distortion.

What has yet to be effectively addressed is the challenging relation between disparate categorizations of psychosocial functions. In terms of contrasting polyhedral mappings, this challenge is remarkably reframed by the pattern of symmetry preserving operations of the [Conway polyhedron notation](#) ([Harmonizing dissonance via polyhedral symmetry-preserving operations](#), 2024). Of similar potential relevance are the so-called [jitterbug transformations](#) (H. F. Verheyen, *The Complete Set of Jitterbug Transformers and the Analysis of their Motion, Computers and Mathematics with Applications*, 17, 1989, 1-3). The term derives from their intensive study by Buckminster Fuller (*Synergetics: Explorations in the Geometry of Thinking*, 1975).

**Question:** It is natural that the triadic system of vitamins, amino acids and minerals should be characterized by the resilience necessary for sustainability. When their psychosocial analogues are mapped onto polyhedra, of interest is then how that resilience might be reflected in both the symmetry preserving operations of the Conway notation and the jitterbug transformations of Buckminster Fuller. Both highlight the dynamics of the transformations between the simplest polyhedra offering mnemonic coherence, such as the octahedron, icosahedron, cuboctahedron and dodecahedron. Could you speculate on what these transformations might imply for psychosocial functions.

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## Intelligent design and engendering self-organization

**Question:** Whilst offering a useful articulation, the response could be challenged because of dependence on the role of a designer or occupational therapist charged with behaviour modification, there is a case for recognizing how any behavioural system may engender "psychosocial rocks" for its own health. Ironically the manner in which individuals and collectives engender "problems" could be seen in this light. How could caged environments be organized so that residents engender problems conducive to their health -- is conflict "inexplicably" engendered for this reason. Would AI involvement imply setting up problems to be solved. The worldwide role of Rubik's Cube as such a rock is indicative

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**Question:** The effect of a "psychosocial rock" in constraining communication around it is consistent with the arguments of Ron Atkin regarding "objects" and "holes" structuring communication space and the dynamics within it. More intriguing is the manner in which this reminiscent of what is experienced as gravity -- felt to be strongest where spacetime is most curved, and vanishing where spacetime is flat. This is the core of Einstein's theory of general relativity, often summed up as: "matter tells spacetime how to curve, and curved spacetime tells matter how to move". Ironically, for those in a space felt to be confined, "flat" is recognized as a condition associated with boredom, in contrast with whatever enables or engenders movement

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**Question:** Framing problems as being engendered "psychosocial rocks" offers the curious possibility that one of the major problems "evil" (cited by many at all levels of society) could be usefully considered in that light - notably in the light of references to the need for evil (elsewhere)

*# Show/Hide AI response #*

## **Triplicity of micronutrients as a comprehensible viable system model?**

The case for recognizing a triplicity of functional significance merits exploration. This is can be argued in terms of the triangulation so fundamental to navigation of a global system (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011). Ironically triangulation has become every more fundamental in reconciling the contrasting forms of bias inherent in the singular perspectives of disparate sources of information -- each readily framed by the others as misrepresentation.

**Question:** Is there a fundamental systemic justification for vitamins, amino acids and minerals as a form of "trinity" vital to health and biological sustainability

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**Question:** Given the speculative quest for psychosocial analogues (as articulated above), how might that response be reframed from that perspective

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**Question:** From a biological perspective is there any case made in systemic terms for a fourth or fifth addition to the 3-fold pattern of vitamins, amino acids and minerals -- and how might this be contrasted with 3-fold, 4-fold and 5-fold sets of psychosocial functions

*# Show/Hide AI response #*

**Question:** It is clearly assumed and recognized that the sets of vitamins, amino acids and minerals constitute viable systems, essential to viability -- whether as distinctive sets or as a triadic set. Derived as they are from evidence-based research, it is then appropriate to ask whether from a cybernetic perspective they are to be understood as a viable system in the light of [viable system theory](#). From that perspective, it is then appropriate to ask whether that theory can recognize (if not prove) that the sets -- individually or together -- are systemically complete in a functional sense.

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**Question:** In considering the micronutrients essential to life, the role of hydrogen, oxygen and nitrogen is not explicitly mentioned -- although these feature in the quest for extraterrestrial planets which could support human life. Is this because (together with carbon), they are fundamental to the composition of the micronutrients. If the role of the micronutrients can be recognized in terms of viable system theory, how does the role of such elements relate to that theory. With respect to any psychosocial analogues, why is it that only the metaphoric correspondence of "oxygen" is recognized as vital..

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**Question:** In exploring the interrelationship of 12 vitamins and 20 amino acids, are there any clues from their factors in number theory -- with 12 (as 3 x 4) and 20 (as 4 x 5) -- given the distinction between the "circle of fifths" and the "circle of fourths" in perceived organization of 12-tone equal temperament music. For Arthur Young (*Geometry of Meaning*) a distinction within a 12-fold pattern is made between 4 triplicities and 3 quadruplicities. Such subsets all suggest a recognition of cycles

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**Question:** From a mnemonic perspective given the challenge of complexity for comprehension, particular constraints are imposed by the "magic number seven". It is then appropriate to ask whether there is a case for recognizing a triad of factors fundamental to the cognitive organization of micronutrients -- whether for the individual or the collective. As comprehensible "factors", this is potentially suggested by 12-fold (3 x 4) "vitamins", 20-fold (4 x 5) "amino acids", and 15-fold (3 x 5) "minerals" -- given Christopher Alexander's "transformations". These factors form a peculiarly "fundamental" cognitive triad: 3 x 4 x 5 -- potentially justifying preferences for 60-fold organization, as discussed in an attached paper [[Sustainability through Global Patterns of 60-fold Organization](#), 2022]. Could you comment.

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## Metabolic pathways and cycles of psychosocial transformation?

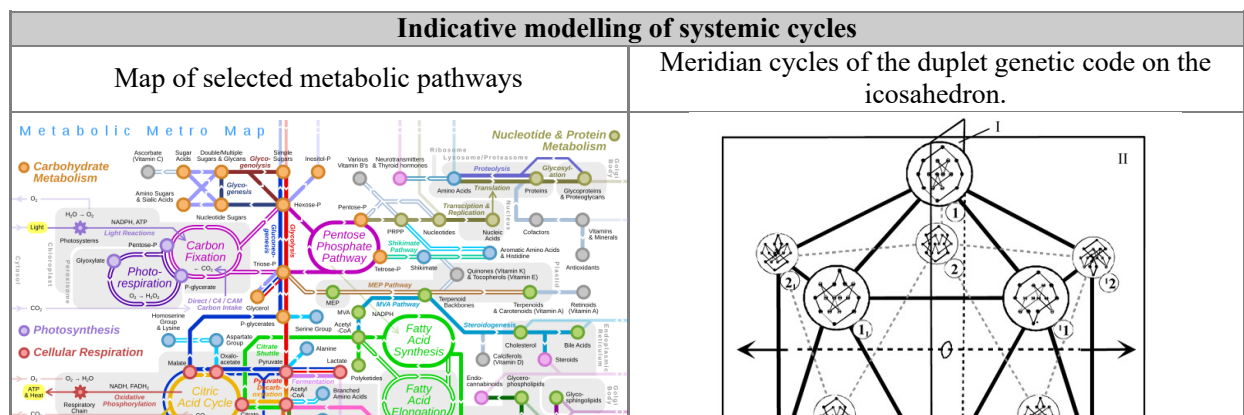
Rather than the strategic preference for focusing on single problems, there is a case for engaging more effectively with their cyclic manifestation -- recognized in reference to "vicious cycles", as argued separately ([Encycling Problematic Wickedness for Potential Humanity](#), 2014; [Examples of vicious problem cycles and loops](#)). Research on proteins values such representation otherwise ([Mapping 3D Structures to Pathways](#), Protein Data Bank, 2016). &&

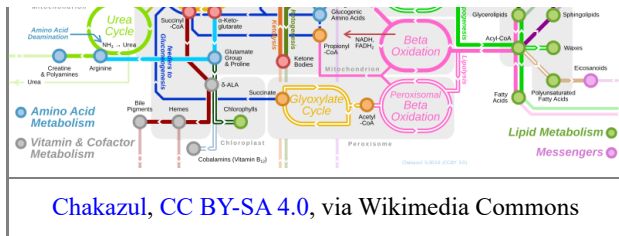
The micronutrients are interrelated in the cells of the human body through extensively documented [metabolic pathways](#), variously presented, (in greater or lesser detail, and periodically revised) -- to better enable their comprehension by different audiences (as emphasized by a far more complex variant: [Map of the Known Human Metabolic Pathways](#)). Noteworthy in that regard is the manner in which those pathways are rendered memorable through songs and limericks (Harold Baum, [The Biochemists' Songbook](#), 1982; Kevin Ahern, [The Metabolic Melodies Songbook](#), 2010). Given the problematic appreciation of human values, it is appropriate to ask whether metabolic pathways offer a template through which they might be comprehended ([Pattern of value interrelationships implied by "metabolic pathways"?](#) 2018).

**Question:** A sustainable pattern of activities is implied -- by which sessility is rendered viable. There is clearly a need for further clues to such a pattern -- beyond the rituals and routines of monastic life. A challenging contrast to the viable dynamics of a "home" is offered by any sense of incarceration -- as variously experienced by prisoners, teenagers, caged pets, or zoo animals. Metaphorically this could be explored in terms of the requisite variety of "perches" between which movement is possible to offer a distinctive perspective. One indicative pattern is that of fundamental [metabolic pathways](#) -- framing the possibility of psychosocial analogues to the "perches" and cycles vital to cellular dynamics. Could you speculate from a systemic perspective on the psychosocial analogues to the amino acids in such maps and the cycles by which they might be linked

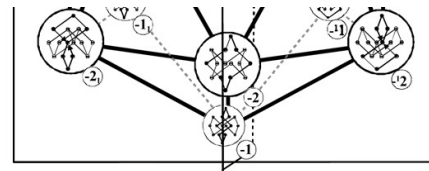
# Show/Hide AI response #

Of potential relevance to this argument in relation to the dodecahedral model (as indicated above) .is the suggested modelling of cycles by Karasev, et al (2005) on the icosahedron (below right)





Chakazul, CC BY-SA 4.0, via Wikimedia Commons



Reproduced from V.A. Karasev, et al, *Dodecahedron-based Model* (2005)

**Question:** Given the attached arguments of V.A. Karasev, et al, *Dodecahedron-based Model of Spatial Representation of the Canonical Set of Amino Acids* (2005), the question is whether their arrangement (great circles, local cycles, etc) bears any relationship to the metabolic pathways and cycles by which they are otherwise linked. In the light of the previous speculation, the further question is whether this is suggestive of a fundamental mapping of psychosocial functions

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**Question:** Given the geometry of the dodecahedron, how many great circles and other cycles can be distinguished

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**Question:** Polyhedra have been recognized as systems in their own right -- by Buckminster Fuller. As metabolic systems, speculative consideration can be given to the potential correspondence of the better known (cyclic) metabolic pathways onto simpler polyhedra such as the icosahedron. If the common maps of such pathways are necessarily selective, this frames the question as to how many pathways are recognized (cyclic or not) and whether more complex polyhedra would offer mapping possibilities with some mnemonic advantages.

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**Question:** Given that considerable effort has been devoted to articulating a 2D map of metabolic pathways (despite its limitations), to what extent can you read such a map (if attached) and propose a 3D variant

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**Question:** Here is the map from *Wikipedia* [above]

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**Question:** The articulation is necessarily a provocative challenge. On the one hand it frames the question as to how the systemic implications of the UN's Sustainable Development Goals might be interpreted within that framework. On the other hand, and far more practically, is how any such set of disparate behaviours would be enabled for those potentially experiencing various forms of "incarceration": a teenager, a prisoner, a hermit, a hospice resident, and the like. As with caged animals, there is also a need to separate the behavioural possibilities to ensure that they are refreshing contrasts and complements

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**Question:** Speculative commentary has been variously evoked by the curious correspondence of the 64-fold pattern of *genetic codon* triplets with the 64-fold pattern of hexagrams of the Chinese *Yi Jing* system. This has further evoked the recognition of a correspondence between clusters of hexagrams and clusters of codons by which specific amino acids are known to be defined [*Proof of concept: use of drilled truncated cube as a mapping framework for 64 elements*, 2015]. Of particular interest is the extent to which the detailed articulation of the transformations between the hexagrams is the subject of traditional interpretation and continuing commentary regarding their psychosocial implications. Successive transformations can be understood as taking cyclic form. Could you comment further on this correspondence.

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**Question:** Although traditional configurations of psychosocial functions (credible to many) can be readily deprecated from the perspectives of conventional disciplines, it is appropriate to ask how dangerous is the apparent incapacity of those disciplines to articulate useful configurations of knowledge of relevance to governance of a civilization in crisis. How is it appropriate to reconcile the strengths and weaknesses of speculation against those of failure of imagination -- as may be recognized by the future.

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**Question:** How many distinctions need to be made and interwoven in order to engender a life of sustainable quality -- and how are these best rendered comprehensible as topological configurations. Could this question be formulated more appropriately

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## **Tuning systems as potentially "healthy" psychoacoustic soundscapes**

**Question:** In endeavouring to clarify contrasting distinctions, such as within the three sets of micronutrients, use can indeed be made of polyhedra such as the dodecahedron. Given the intimate relation to the psychoacoustic appreciation of sound, the use of the octahedron by the hexany tuning system suggests that the various tuning systems could be related to polyhedra. With the importance of music and polyhedra to the Pythagoreans, is there any trace of how they might have variously clarified distinctions in this manner

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**Question:** Given the potential mnemonic coherence from use of the dodecahedron to hold the distinctions within the sets of micronutrients, is there any specific trace of its use for the organization of tones, as with use of the octahedron for the hexany

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**Question:** Especially intriguing in the case of the semi-regular polyhedra is the manner in which they can be transformed into one another, notably as clarified by the symmetry preserving operations of the Conway notation [*Cognitive operations potentially analogous to generation of tiling patterns*. 2021]. Given the psychoacoustic confusion between contrasting patterns of distinctions made by tuning systems, do those geometric transformations suggest a means by which their cognitive implications might be reconciled.

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**Question:** Metaphorically, it could be assumed that people (and even collectives) organize their lives within a tuning system. As with vitamins, for example, would deficiency in a particular tone be detectable in some way if it was systematically omitted from the music of that tuning system. The question recalls the challenge of the tritone.

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**Question:** Reverting to the examples offered by the "confined" (prisoners, hospice residents, teenagers, hermits, caged animals), any quest for a healthily requisite variety could be usefully explored through the tuning systems they engender -- and the tones that might be omitted from them. This could prove especially insightful in the case of caged wild animals deprived of the variety of tones in their habitual natural soundscape

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**Question:** The argument highlights the possibility of some form of correspondence between the distinct micronutrients essential to physical well-being and the variety of forms of psychosocial "nourishment" vital to well-being of the psyche -- potentially to be recognized as an "information diet". The implications for such a

"diet" for a collective are clearly fundamental to media content and strategic uptake. Could the UN's Sustainable Development Goals be revisited from that perspective -- as potentially characterized by "malnutrition" and "stunting"

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**Question:** Although there are allusions to the need for "musical vitamins" essential to a healthy "musical diet", these do not seem to be related to the more articulated possibility of the 12-fold "circle of fifths". Could you comment on the psychoacoustic implications of such a metaphor for musical therapy in the light of the attached paper [Daniel L. Bowling, *Biological principles for music and mental health*, *Translational Psychiatry*, 13, 2023]

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