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RESEARCH ARTICLE

Primal Awareness - Science, Religion, and a Route to Consciousness

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Abstract

We indicate that energy is arguably a scientifically reduced model of Universal primal awareness. This then implies that our conventional scientific ‘world view’ is itself a reduced model of a more complete reality, which primarily constitutes awareness as a, or the Universal mode of existence. This implies that our habitual relationship with our environment is to a degree erroneous, and that this begets a feeling of incompleteness of experience. We propose that this feeling is responsible for the widely observable establishment of religion, in its interpretation as evidence of a supernatural presence, usually involving a personal relationship. We maintain that recognition of the dichotomy we describe should be a vital part of system design and operation. We represent neural operations by a hierarchy, which can be decomposed into two partial hierarchies, one for the operational levels, one for the inter-level complex regions. We compare the neural hierarchy with atomic energy levels, and conclude that these are more correctly levels of awareness. We propose that awareness is amplified up through the neural hierarchical levels, producing consciousness, and that mutual observation between the two representative hyperscales generates self-awareness.

Introduction

The starting hypothesis here is that a low level of primal awareness is the most fundamental property of the Universe^[1]. It appears, for example, to be present at the origin of quantum mechanics^[1], as, itself, the Universal formulation of matter, rather than its being simply a human invention. Or even that the Big Bang constitutes the appearance of awareness. But first, what do we mean by ‘awareness’. It is not at all a categorized relationship directly between different entities, as we might suppose on the basis of common use of the word. It is purely a sensation experienced by an entity, consequent on the existence of other entities, processes, or events. This aspect is summed up succinctly by Peirce, in his defining of ‘Firstness’:

Firstness: a mode of being “such as it is, positively, of itself”^[2].

“The First is that whose being is simply in itself, not referring to anything”^[3].

"It must be initiative, original, spontaneous and free"^[4].

"A Firstness is exemplified in every quality of a total feeling. It is perfectly simple and without parts"^[5].

Imagine yourself as a completely isolated entity in empty space. No externally driven sensations would exist for you. Then, suddenly, a second entity appears close by. Given a capacity for awareness you would likely initially receive a simple uncategorized sensation of 'something'. So, at the very least, we are specifying that all entities have an inbuilt 'capacity to be aware'. Comparison with the function of sight is obvious here. A sighted entity (organism) in the same situation would arguably initially receive an uncategorized optical sensation, before identity is attributed to 'what is seen'. Firstness operates in the same way – or more correctly, this *is* Firstness. The subsequent attribution of identity is a further, later stage of perception.

This attribution of primal awareness to all our environment is, however, massively controversial. We present it as a hypothesis to fill the void of other hypotheses in explaining in a unified, coherent manner the wide panoply of processes or events which surround us, which it does. This follows the fundamental scientific technique of formulating a provisional model from experience or innovation, and as such it remains a valid 'model' until disproved.

In proposing that primal awareness implicates all we follow in the footsteps of David Bohm. To quote from an interview with Bohm ^[6]:

Bohm: I would say that the degree of consciousness in the atomic world is very low, at least of self-consciousness.

Weber: But it's not dead or inert. That is what you are saying.

Bohm: It has some degree of consciousness in that it responds in some way, but it has almost no self-consciousness (the italics are Weber's).

...

Weber: you are saying: 'This is a universe that is alive (in its appropriate way) and somehow consciousness at all the levels' (the italics are Weber's).

Bohm: Yes, in a way.

Two aspects of this quote are important to note. First, we would prefer to use the word 'awareness' rather than 'consciousness'. We will elucidate this distinction later. Second, we do not accept that the result of primal awareness is automatically life. Again, more on this later. But the general tone of Bohm's position is that primal awareness (our words) permeates all, as we maintain.

Energy and Awareness

Our total conventional environmental recognition and mental functioning are firmly based on a belief in the reality of energy, as it is scientifically formulated. But how has this come about? It is notable that the most useful basis for any modelling structure is that aspect of a situation which is least understood, thus avoiding any necessity to explain it: in this case *energy*. Organisms as we know them are the result of millions of years of presumed evolution, and an associated development of means to influence their environment. Since time immemorial this has arguably consisted of a parallel evolution of the presumption that rationality is a sufficient representation of Natural conditions and events. The strongest apparent evidence for this has been, and is, the capability to successfully develop a widely applicable and coherent rationality based 'world view' mirroring the overall self-consistence of science. Consequently, we in the West now 'live in a world' completely characterized by this conventional scientific framework, referred to energy.

However, it is not necessarily the case that current scientific framework 'correctly' represents the presumed reality it models. There have over the centuries been examples of the sudden realization of a discontinuity between 'science' and Nature's properties. A major incident of this kind is that usually referred to as 'the ultraviolet catastrophe' [7]. Up to this juncture, at the end of the 19th century, science was assumed to be complete in terms of classical physics, leaving only small details still to be resolved. And then it was noticed that existing theory failed to correctly represent experimental evidence of the emission of radiation from hot entities.

Reaction to this important omission resulted in the development of quantum physics – a radically different scientific framework, which to a great extent successfully replaced belief in classical physics. It is also arguable that we are currently in the middle of another great change, in that there is wide recognition that the most important aspects of definable systems are the inter-elemental relationships between implicated entities, rather than their individual properties [8]. In the case of living systems, early pioneers of this development have been Nicolas Rashevsky [9] and Robert Rosen [10].

So, we take as reasonable that the conventional world view based on science is not necessarily complete in its representation of a presumed underlying Nature, even though this acceptance is strongly promulgated through quantum physics, where this physics is often pictured as itself *being* Nature [11], as opposed to representing an underlying reality. A consistent adversary of this assumption has been, again, David Bohm, especially with his proposition of 'hidden variables' in quantum mechanics [12]. We note in passing that examination of a hierarchical representation of living systems reaches, and explains, a similar appearance of apparently hidden properties [13]. And, also, that classical and quantum physics constitute a complementary pair, rather than that quantum physics replaces classical physics [14].

Let us sum up these latter paragraphs. Our position is that in a search for environmental control organisms have progressively fixed their world view on the scientific means of their attempted control, but that this world view does not exactly match an apparent underlying 'reality'. Further than this, we believe that in doing so a vitally important aspect of reality has been left out of consideration.

We believe that energy is an incomplete but rational recognition of primal awareness. It is certainly close enough to permit the development of a self-consistent (scientific) world view, but in doing so it removes us from intimate contact with our

surroundings. This manifests itself in a wide panoply of ways.

Awareness and Life

It is easy to make a mistaken equivalence between awareness and life. Awareness is, of course, associated with life to the extent that it is virtually impossible to imagine life without its supporting awareness, but the primal awareness to which we refer predates any exposition of life, or even of other more primitive life-supporting elements. We argue that primal awareness predates all other Universal components, including the quantum mechanics which is currently supposed to be their origin. From its initial inception, through autocatalysis to abiogenesis, awareness has almost certainly provided life with structural security, as well as a route towards the development of complexity.

Scientific and Religious World Views

In our introduction we addressed Peircean Firstness. This appears to be recognition through and of primal awareness, unfettered by the conventional world view. However, the world view rapidly imposes itself as a comparative filter – Peircean Secondness:

Secondness “is such as it is relative to something else”^[15].

Another term is “reaction”^[16].

Secondness or “brute actions of one subject or substance on another”^[17].

The initial experience of primal awareness is rapidly replaced by elements of an energy-based world view comprehension. However, it does not seem that this dichotomy of recognition is only local to events, but that it provides the backdrop to all our experiences. We have built a ‘scientific’ world view which is fundamentally dependent on the arguably mistaken recognition of awareness, while directly experiencing the world through awareness itself.

It is very tempting to attribute many human features to this dichotomy. And, yes, we will go there, with humility. A common feeling is one of separation from Nature. Within our description this is no surprise. Global evaluation indicates that a very large proportion of humanity is involved in religious practices, and this arguably as a result of the downgraded world view which is consequent on environmental control, and the feeling that ‘there must be more to life’. The common invention of a supernatural presence is then no surprise – particularly if this presence exhibits a personal relationship and individual care. A resulting comforting impression is that responsibility for our existence is exercised by an external presence.

Current Western philosophy insists that a world view be self-containedly rational. Thus, at least, within Secondness, to the exclusion of Firstness, which is demoted to the domain of emotion. This is mistaken, as emotion has an important part to play in the use of logic. It is arguable that logic is impossible in the absence of emotion ^[18]. As a simple example of this, consider that logical formulations – which we may describe as ‘models’ – are always reduced representations of the reality

of situations. A little recognised feature of the use of such models is that they permit the exposition of meaningless questions, and of unresolvable contradictions or 'logical cul-de-sacs'. A prime use of emotion is in escaping from such blockages in a way which is inaccessible to logic itself.

On one hand we may imagine a world view uniquely based on Firstness; on the other a world view uniquely based on Secondness. Neither of these is very useful, as the resulting picture is incomplete in both cases. The combination of the two will provide the most robust world view, including a means to escape from threatening contexts, rather than a fixation on rationality. Historically, primitive societies were to a large extent protected from over-rationalisation, and consequently closer to completeness of world view: note the early belief that everything in Nature had a spiritual nature. In addition, it is particularly arguable that Eastern philosophies and religions are closer to a usefully balanced world view than those of Western societies, where science is more strongly embedded. A useful development here would be to base considerations more on narrative rather than uniquely on structure.

A Route to Consciousness

Neural Hierarchy

In a parallel paper ^[19] we have shown a hierarchical representation for the brain's operations – reproduced here as Figure 1.

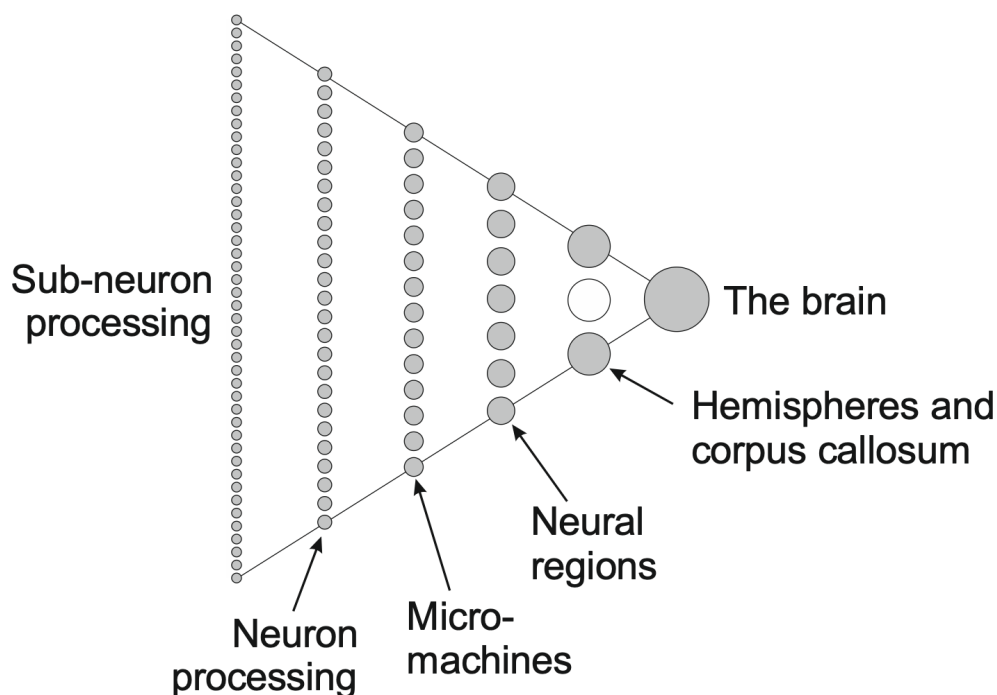


Figure 1. A hierarchical representation of the brain's operations.

We gave justifiably great attention to the inter-level regions, which are Rosennean complex^[10] as indicated in Figure 2.

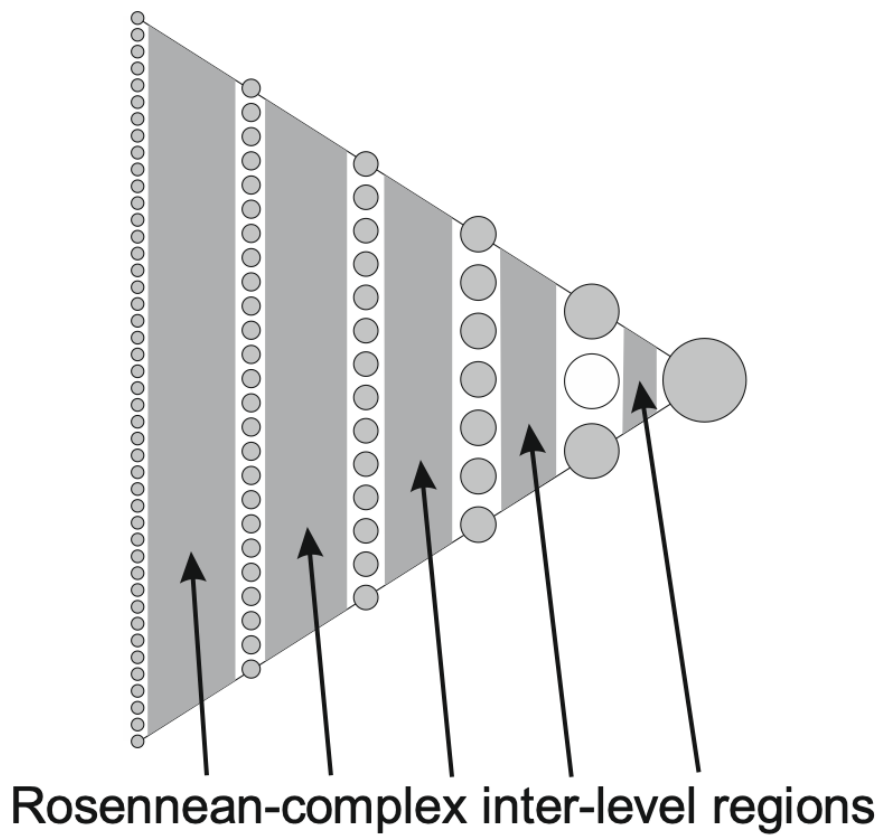


Figure 2. Rosennean inter-level regions of the neural hierarchy.

These inter-level regions form the 'ecosystems' for the emergence of their following levels, as illustrated in Figure 3.

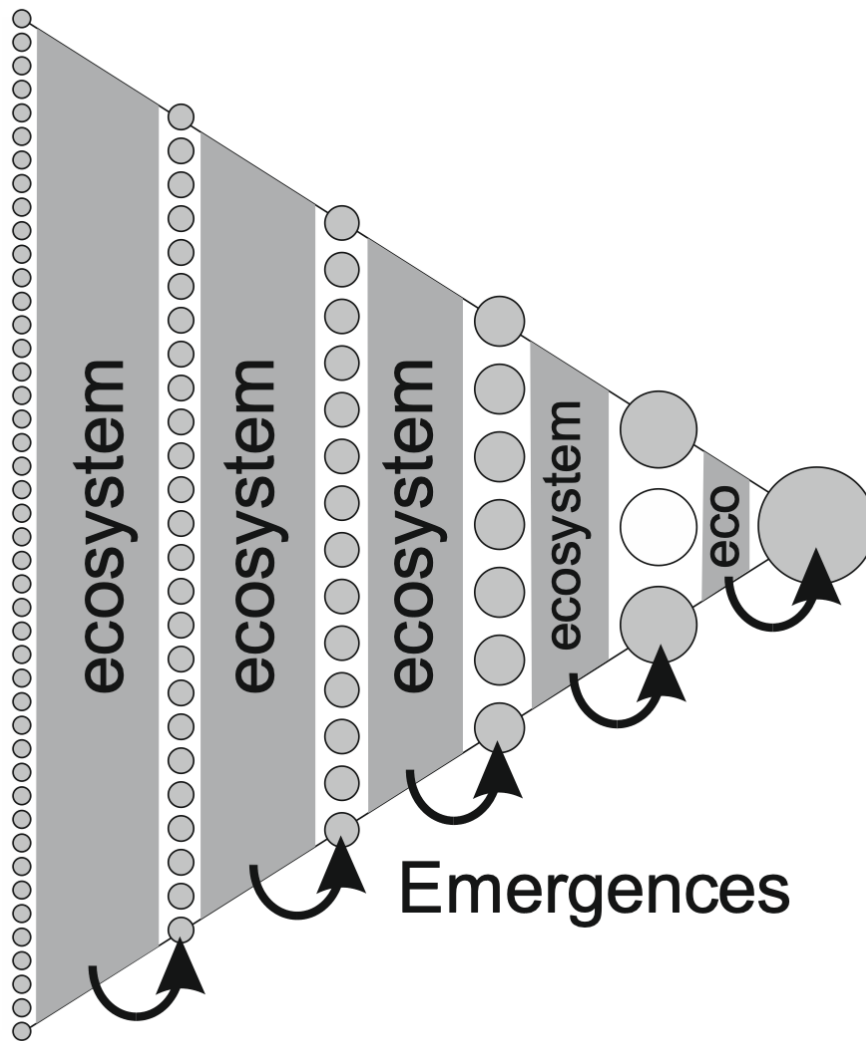


Figure 3. The complex regions form the 'ecosystems' for emergence of the following levels.

Extracting a single entity from an ecosystem leaves most of the ecosystem intact; extracting most of the entities leaves only a small ecosystem. Consequently, our Figure 3 is in error: Figure 4 corrects this.

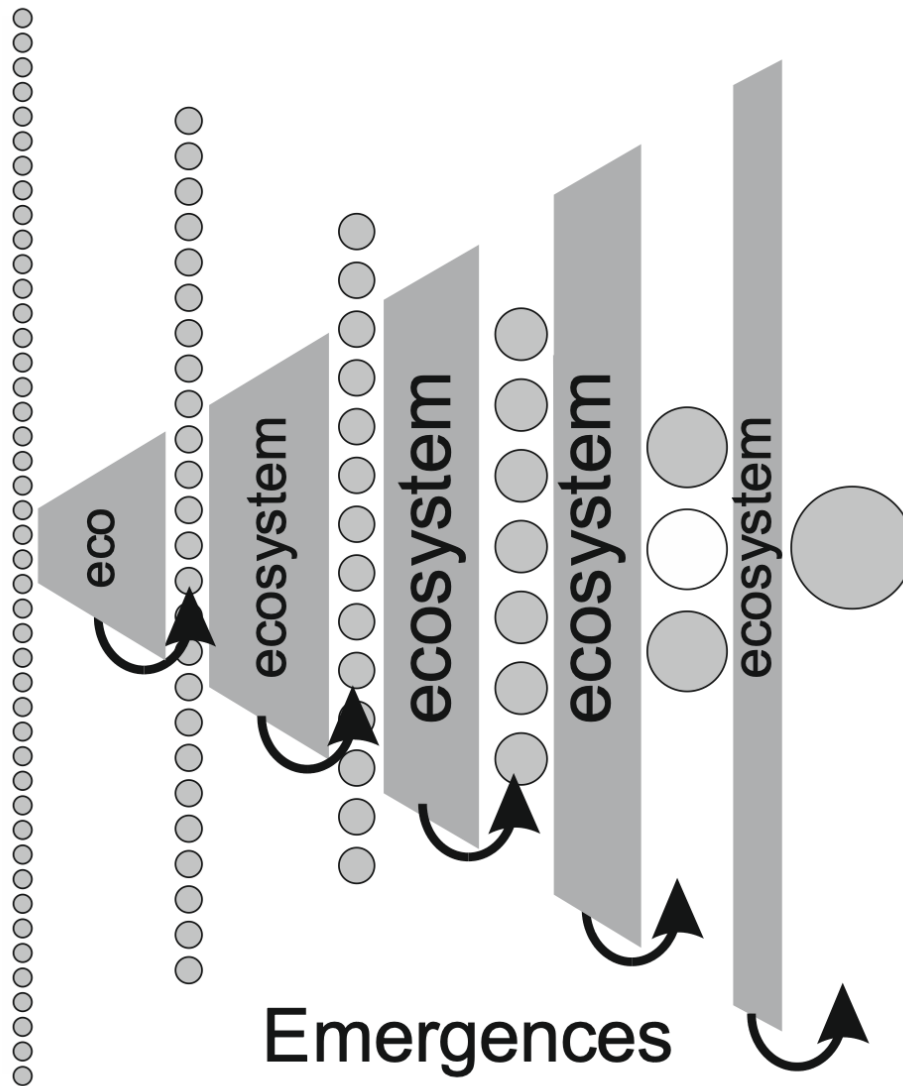


Figure 4. Figure 3 adapted to indicate the relative magnitudes of the ecosystems.

If the original levels form a consistent hierarchy – a necessity in creating a unified structure – then the ecosystems, related to the levels, also form a consistent hierarchy. The complex-region partial hierarchy can be conceptually separated, as in Figure 5, where much possibly confusing detail has been left out.

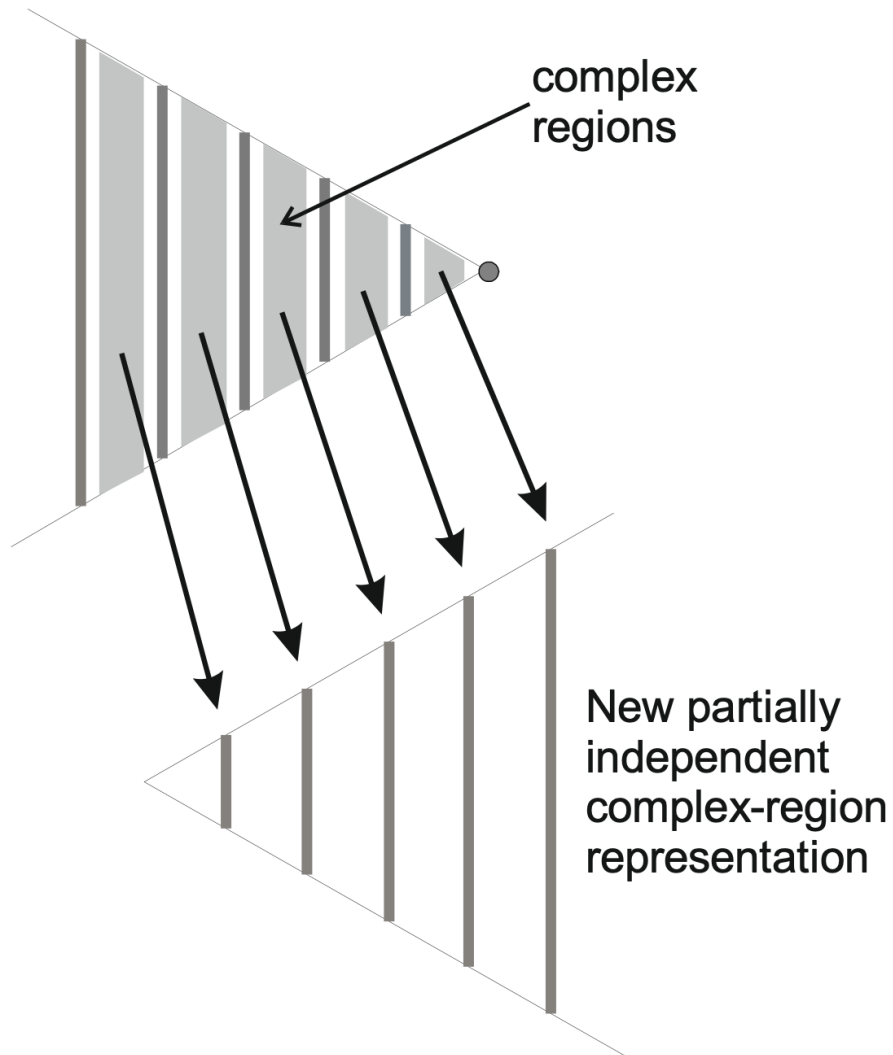


Figure 5. The separating-out of the complex-region partial hierarchy.

This leaves us with the following symbolic representation of the neural hierarchy we have proposed.

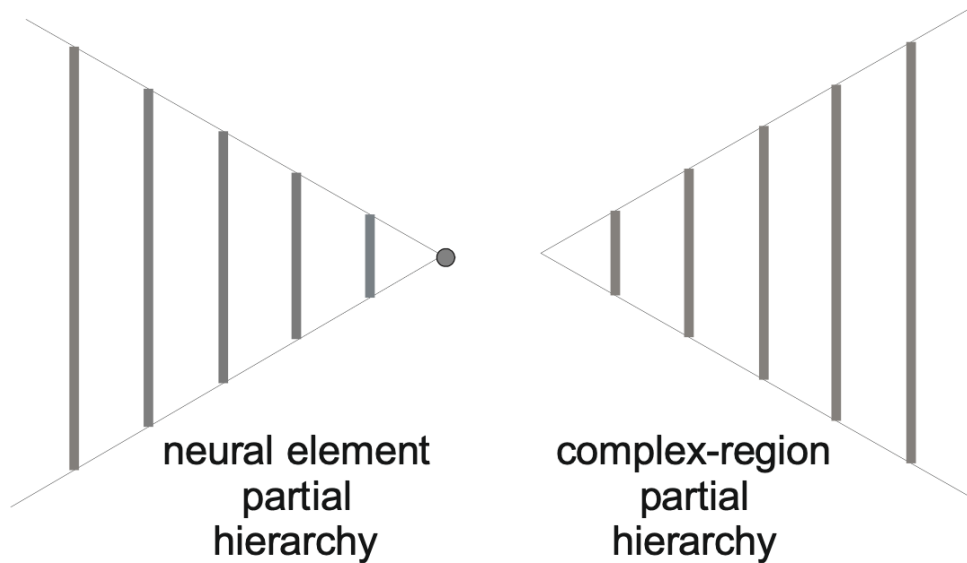


Figure 6. Our final symbolic two-part representation of the neural hierarchy.

Solid State Electronics

It is instructive in the context of our investigation of energy-based interpretations to look at the energy characteristics of an atom – Figure 7.

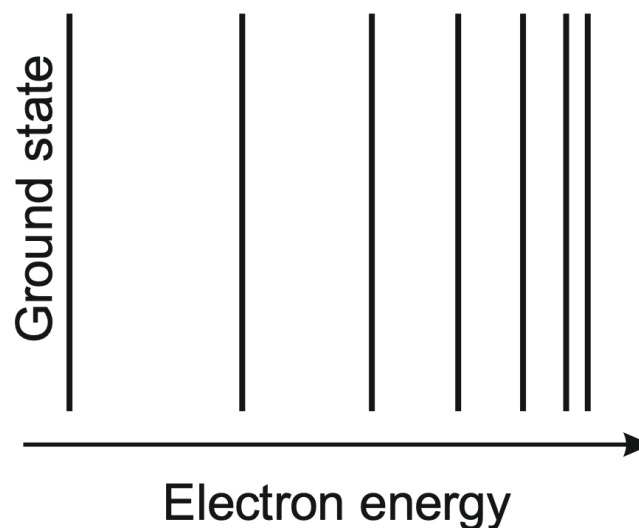


Figure 7. the feasible energy of electrons surrounding an atomic nucleus.

This image describes feasible electron states around an atomic nucleus within the conventional energy-based scenario. We quote from earlier in this paper: “*We believe that energy is an incomplete but rational recognition of primal awareness.*”. So, following our train of thought, the ‘energy’ levels of Figure 7 are in fact levels of awareness! It is interesting to look at this comparison more closely, to see what happens to these levels when a multitude of atoms are

joined together in close proximity in a crystal, for example of silicon – Figure 8.

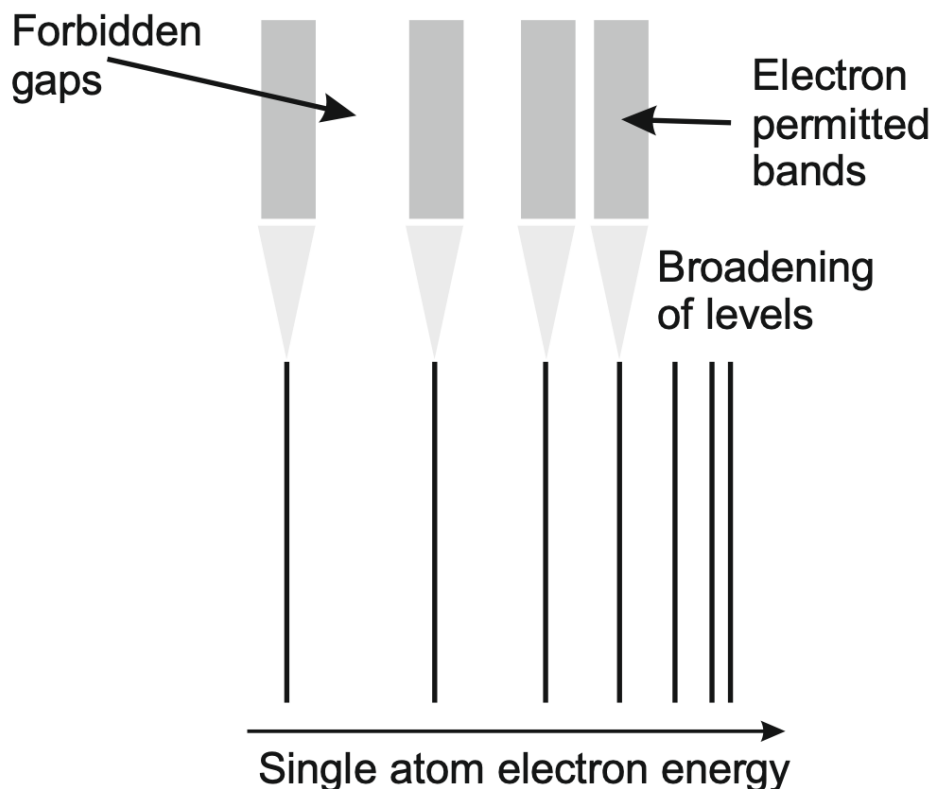


Figure 8. The broadening of electron 'energy' levels with massive increase in the number of electrons in a crystal.

It is not a great step to realizing that the picture of Figure 8 resembles that of Figures 2 and 4, where defined levels are separated by complex regions. In both cases, occupancy of the inter-level regions is forbidden, and transit between defined levels – emergence in both cases – may well be characterized by some kind of quantum error correction.

Computer Characterization and Life

Conventional digital computers are characterized by the size of their elemental gates. Although this dimension is constantly being reduced, there is an ultimate limit to how small they can be made. This limit, plus the fixed maximum of communication speed – the speed of light – restricts the capability of digital computers. Figure 9 illustrates this, for two computers with differing elemental gate sizes.

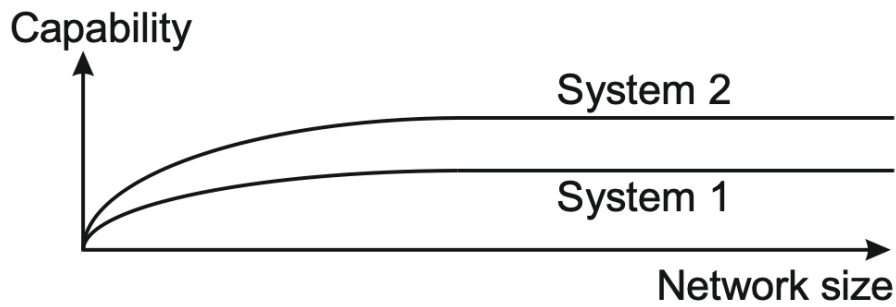


Figure 9. Comparison between the capabilities of two digital computers. The elemental gate size of System 1 is bigger than that of System 2.

However, there is another possible computation medium which is not dependent on digital computer elemental gate size, namely chaotic computation [20]. Superimposing this on Figure 9 gives Figure 10.

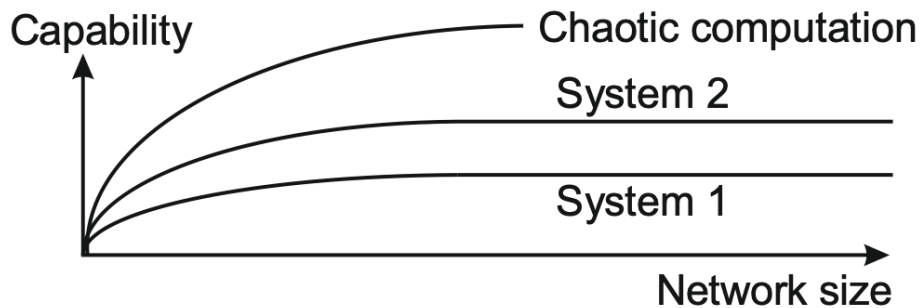


Figure 10. The superposition of chaotic computation on Figure 9.

We believe that the use of chaotic computation permits access to a new higher level of capability, that is to say, of *awareness*. We illustrate this in Figure 11.

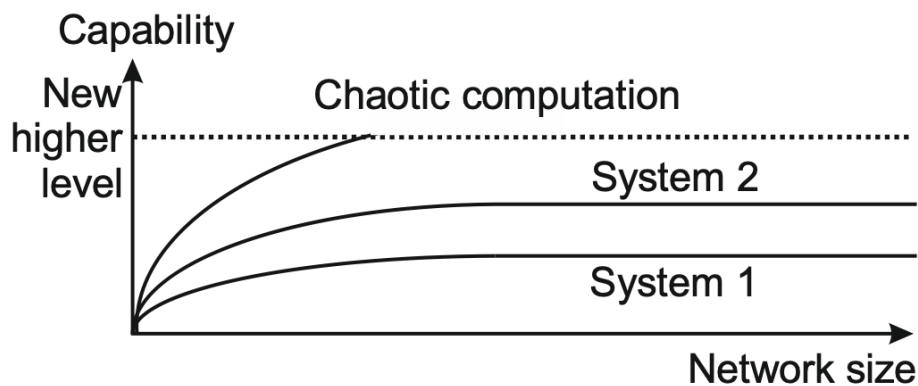


Figure 11. Chaotic computation permits access to a new higher level of capability as indicated.

The new higher level, inaccessible to logical elemental gate computers, may well be a fundamental limitation of the Universe, which is 'bypassed' by living systems using chaotic computation. We believe that this is not the end of the story: that there are yet more new higher levels of capability/awareness, accessible again by chaotic computation, as illustrated in Figure 12 [21].

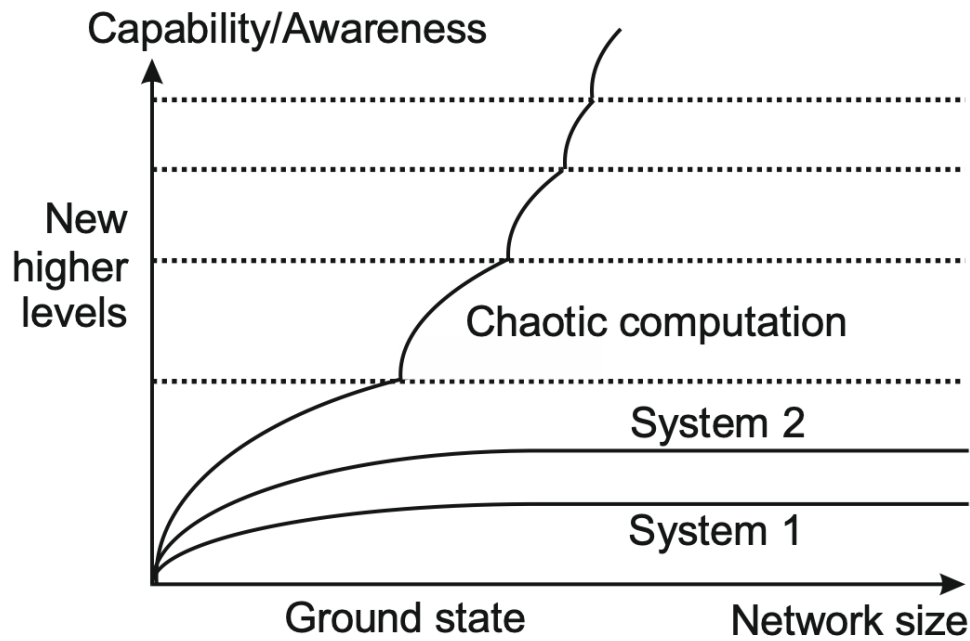


Figure 12. Access to higher and higher states through the use of chaotic computation.

We tentatively identify these new higher states with the defined levels of Figures 1, 2, 3, 4, 7 and 8. We have all the time been describing aspects of *the same* hierarchical structure!

From Awareness to Consciousness

It is notable that the brain exhibits the densest information processing in the Universe. We have also pointed out [21] that this extreme density is necessary to permit the attainment of higher processing states. We believe that primal awareness is amplified through access to higher and higher processing states in the brain, resulting in the phenomenon of consciousness [22][23]. If this is the case, then the degree of consciousness would follow the degree of information processing, and, seen simplistically, consciousness would be related to the size of the brain in consideration. This would indicate that smaller animals or plants¹ would experience less consciousness than the higher mammals – chimpanzees, for example.

Self-Awareness?

Now we come to a difficult point. Unfortunately, it is not possible to accurately access hierarchy internal levels from

outside, as their contents are purely subjective (similarly to the lack of access to a brain's contents from outside). But we do this all the time! How? Attempted access results in the objective formulation of an approximate representation of internal level contents, referred to as *hyperscale*^[14]. Figure 13 indicates this process. As we have two partial hierarchies, there will be two quasi-independent hyperscales, as Figure 13 shows.

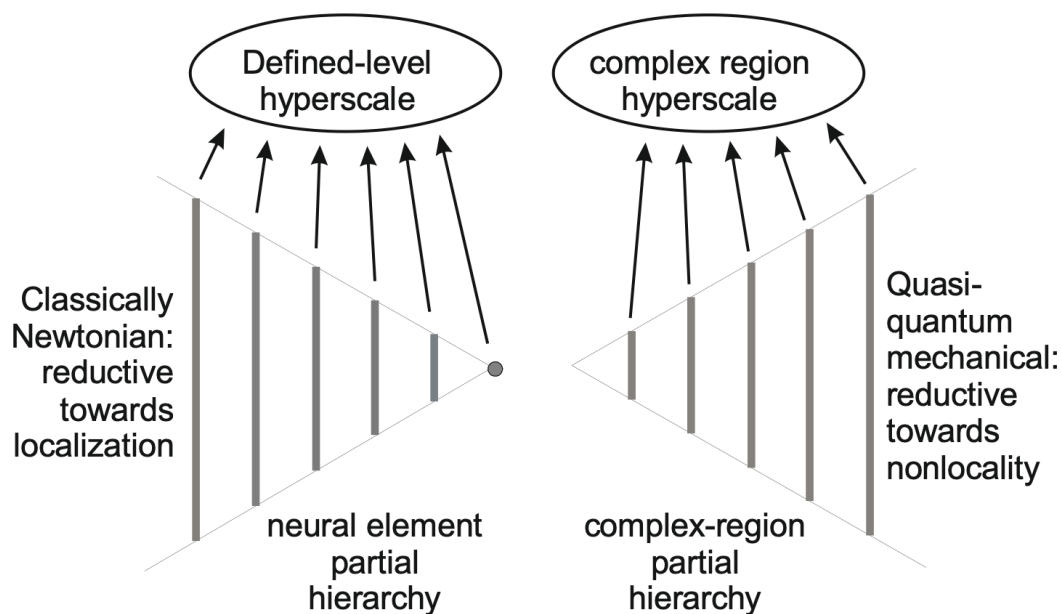


Figure 13. Generation of the two hyperscales from the partial-hierarchy pair derived in Figure 6. We note in passing the appearance of the complementary pair between classical and quantum mechanics.

Koichiro Matsuno^[24] has characterized measurement as 'mutual observation'. We believe that this is what happens between the two hyperscales, giving birth to self-awareness, as in Figure 14.

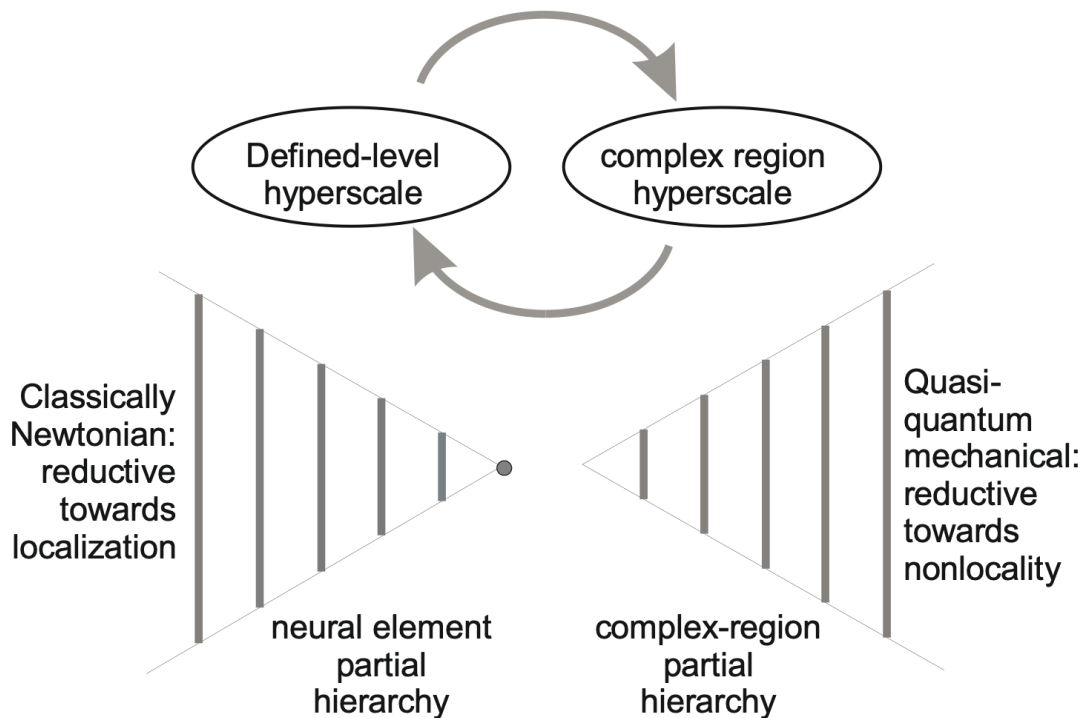


Figure 14. Mutual observation between the two hyperscales possibly generates self-awareness.

Conclusion

We have indicated that energy is arguably a scientifically reduced model of Universal primal awareness. This then implies that our conventional scientific 'world view' is itself a reduced model of a more complete reality, which primarily constitutes awareness as a, or the, Universal mode of existence. This implies that our habitual relationship with our environment is to a degree erroneous, and that this begets a feeling of incompleteness of experience. We propose that this feeling is responsible for the widely observable establishment of religion, in its interpretation as evidence of a supernatural presence, usually involving a personal relationship. We maintain that recognition of the dichotomy we describe should be a vital part of system design and operation.

The complete neural hierarchy representation can be decomposed into two partial hierarchies: one of the defined levels, one of the inter-level complex regions. We have emphasized that the complex inter-level regions of a neural hierarchy form the ecosystems for emergence of the levels themselves.

The electronic structure of an atom shows similarities to the neural hierarchy, and it is argued that the 'energy'-levels are more correctly levels of awareness. Conventional digital computers are characterizable in terms of their gate-sizes. Chaotic computation permits access to higher operational levels, which appear to correspond to the neural hierarchy levels.

We believe that primal awareness is amplified up through the neural hierarchical levels, in the manner that 'energy' is amplified up through the atomic levels, contributing consciousness. External access to the hierarchical contents is

facilitated by the automatic generation of an approximating hyperscale. One hyperscale is formed for each of the two partial hierarchies, and mutual observation between the two feasibly contributes self-awareness.

Addendum

This paper is the latest publication from a project which has now spread over 30 years. We have tried here to indicate various stages in its progress through access to publications spread over that timescale. This is why the following list of references contains a comparatively large number (9) of self-citations.

Footnotes

¹ There is much research these days into plant intelligence, and their root-tips resemble neural construction.

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