

Awakenings III

Perceiving the hidden in plain sight



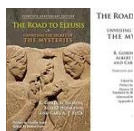
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Awakenings II

PETER WEBSTER • 15 APRIL 2024

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I concluded Awakenings II with the claim,

"In order to understand how psychoactive use might have played an essential role in human evolution, a complete revision of the theory of how psychedelics actually work is necessary."

I will tackle that seemingly formidable task here as part of a general account of the evidence that leads me to believe that psychoactive plants have indeed played an important, and very probably a *necessary* role in early human development. But we have some considerable ground to cover before I show why our current theory about "psychedelic effects" needs to be replaced.

His disciples said to him, "When will the kingdom come?" <Jesus said,> "It will not come by waiting for it. It will not be a matter of saying 'here it is' or 'there it is.' Rather, the kingdom of the Father is spread out upon the earth, and men do not see it." ¹

I seldom accede to the temptation to use Biblical quotes to advance an hypothesis. Both in The Bible as well as Alice's Restaurant, "You can get anything you want". But since Bishop Athanasius excluded Thomas' Gospel from the officially recognized texts of the Bible — I guess he considered it fake news — this saying seemed even more suitable to provide some context for the Psychedelic Awakening scenario I am constructing.²

At first glance, two questions might be posed. Why do men not see it? A rather lengthy analysis is required. In [KOSMOS](#) I discuss the overwhelming dependence on *habit routine* as the default state of consciousness, an everyday and quite abbreviated view of the realities around and within us that is the direct legacy of evolutionary necessity. The conclusion is that the *habit routine* governed "survival and reproduction" mode of consciousness was for most of prehistory far more propitious for continuing the human trajectory than the "creative philosophical" mode of consciousness. A transition from a near total dependence on the former mode to the latter would indeed be an awakening. Future essays here on Substack will combine and streamline the discussions in KOSMOS to render my *habit-routine* theory more reader-friendly.

...and the second question: if all (or even most) men saw it would that bring about the kind of societal changes that religions of every sort claim to promote? Is Thomas suggesting that an awakening to the "hidden in plain sight" is the key for salvation? The pathway to peace and harmony among all the tribes of Man, or something equally as promotional of a non-suicidal future for the human race?

It seems no mystery why religious authorities both Biblical and modern might balk at the idea that what we seek is already at hand: no need for endless religious lessons, initiations, confessions, sermons, tithes, and hopes that an afterlife will provide what is lacking here if one obeys those authorities. In a larger sense, if humankind would collectively awaken to the essential reality of existence, to its mystery and thus its sacredness, to a realization that indeed, the kingdom of the Father is omnipresent, that would necessarily crimp the ability of "authorities" of every sort to propagandize their subjects into beliefs and behaviors clearly at odds with their true needs and aspirations.

Thomas' saying is surely not in accord with most "organized" religion, nor with organized government, but it is strangely illustrative of the Zen training that only a sudden awakening is necessary to reveal what has been always omnipresent but overlooked.



But what kind of awakening am I proposing? What would being aware of that "kingdom of the Father that is spread out upon the earth" be like for us moderns, and how might such an awakening have, aeons ago, provided a spark for human evolution?

For Early Proto-Man to see it, ³ an awakening of some sort would seem an appropriate hypothesis, but of course it would not be referenced to Christendom or other modern religious beliefs.

For Modern Post-Industrial Man to see it a rather forceful awakening would seem necessary to neutralize the general attitude that "I'm excruciatingly awake already so mind your own business" and "Take a drug to wake up? Oh, really..." It can be a thankless task just to *suggest* to someone that they might not be "awake" in important ways.

But before continuing, a review of the Awakening scenario I proposed in my talk at the 2006 LSD Symposium at Basel, Switzerland. That hour-long address was a synthesis of ideas I had long been assembling for Chapter 8 of KOSMOS, "Early Man".

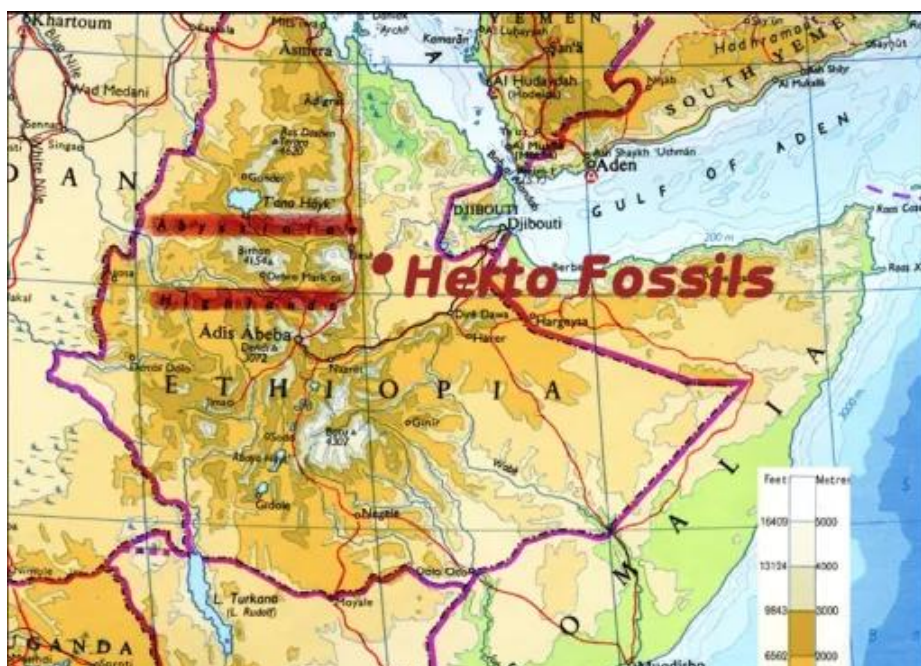
Evidence - a timeline for Awakening?

I had been collecting studies that bear on my proposed Psychedelic Awakening evolutionary scenario since writing the first version of the hypothesis for KOSMOS in the early 1990s. What is most obvious today is that the entire body of evidence —paleoanthropological, geological, psychological, philosophical — has become much more complicated to the extent that it is now impossible to construct a time-line and location reasonably consistent with all the new facts and findings. It is even difficult now to evaluate the possible importance of certain events such as the Toba eruption, for example.

[Evidence suggests Toba volcanic winter was less lethal than thought](#)

[Doubt over 'volcanic winter' after Toba super-eruption](#)

In my Basel presentation I had suggested that the Toba eruption and a die-off of plant life due to the resulting volcanic winter might have caused a survival crisis in East Ethiopia's Herto population that drove them up into the mountain forests in search of food. Food being scarce everywhere, they may well have had to try to survive on all sorts of inhabital foods such as *mushrooms*, species of which might have proliferated wildly and widely if a volcanic winter had laid waste to much plant life, providing an abundance of decaying organic matter.



As for human dispersal out of Africa, movements and migrations, genetic analysis, single- vs. multiple-origin theories of modern humans, et al., the findings of the past 20 years also complicate matters greatly, see for example

[Did Our Species Evolve in Subdivided Populations across Africa, and Why Does It Matter?](#)

All proposed timelines and scenarios for a Psychedelic Awakening are therefore hypothetical in the extreme, but they still can illustrate *what kind of situations* might have provided the opportunity for a group of proto-humans to suddenly perceive the "hidden kingdom of the Father" as manifest and in plain sight.

Some Remaining Evidence

If a "when and where" enquiry based on "stones and bones" evidence from anthropological digs seems increasingly to provide little that is useful for demonstrating the reality of a human Psychedelic Awakening, what remains for advancing the hypothesis are the following considerations:

1) The extremely long period between the first anatomically modern humans and—much later—the rapid appearance of cognitively modern humans, humans exhibiting *symbolic behavior*. This consideration applies even if the definition of anatomically-modern has become more diffuse. Presumably the anatomical differences that qualify as modern, cited by Stringer and others for the various groups back to 300,000Kya, leave all representatives from the period as possessing the *potential* for symbolic thinking and language and other characteristics that are required for psychedelic awakening and the genesis of a shamanic tradition. Given the long cognitive sleep of 100-300 thousand years, through the thick and thin of all sorts of extreme changes that might be posited as a wake-up catalyst, why then did the awakening

occur at all?... why aren't we still stuck in a proto-human state? The conclusion is that something novel, specific and important ignited the process of awakening, and it was sudden, not a gradual process.

2) The prevalence of psychedelic shamanism worldwide, both in recorded history and evidence of the same in prehistoric times. (see illustration below).



Distribution of use of psychoactive plants in traditional cultures

The *Scientific American Library* series counts among its handsome and lavishly illustrated volumes its *Plants, People, and Culture – The Science of Ethnobotany*, and devotes an entire chapter to plants that have been used for “Entering the Other World”. A world map shows clearly just how universal psychoactive plant use has been, the historical locations of use of a dozen of the major plant species being shown across the globe. ⁴

Now if psychoactive plant use by early, cognitively-awakened *H. sapiens* was as widespread as indicated, then it would be hard to maintain that such use suddenly came into being independently in all the far reaches of the globe

where humans settled starting about 50 or 75 thousand years ago. It is logical to conclude that the use of psychoactives was already a universal among human émigrés and so must go right back to the place of modern human origins, in Africa.

3) The seldom disputed claim that the seeking of altered states of consciousness is a *human universal*.⁵ Brown's [published list of universals](#) is a thought-provoking list indeed, and includes a wide range of human behavioral characteristics. Of particular interest for us here is this one: "Mood- or consciousness-altering techniques and/or substances." Other researchers too have expressed similar views, see for example, Andrew Weil:

...the desire to alter consciousness periodically is an innate, normal drive analogous to hunger or the sexual drive.⁶

4) The general agreement that culture arose rather rapidly compared to the long period of stasis, and that there seems to have been some kind of trigger event that precipitated the trend.⁷

5) The constantly reappearing mythologies about an awakening, a forbidden fruit, a Genesis of Man account, as mentioned previously in Awakenings II.

Points number 1 and 2 effectively "squeeze" the time-line argument from both sides. Our exceedingly long gestation during which we were not-yet-cognitively-human indicates that habit-routine-governed existence was a powerful characteristic of proto-humans completely holding us in check. And then the near-universal prevalence of psychedelic shamanism later in the game, not very long after the proposed awakening, must demonstrate that these practices originate *from and during* the awakening period, and that they *accompanied* modern humans in their migrations to all parts of the globe, a point stressed by Ian Tattersall (see the following excerpts from his recent book.) If ASCs are to be a human universal, it seems obvious they would not have sprung into existence willy-nilly, here-and-there, at random, independently, yet world-wide. Surely there would have been many groups of humans that never developed the shamanic tradition were it not a *universal*. Yet in every corner of the earth, we see one or more psychoactive plants

being of major importance.

This could not have been a hit-or-miss occasional scenario, but rather it indicates that even before his migrations Early Man *already knew* about psychoactive plants and had a shamanic tradition for governing their use. The migrations surely had multiple reasons, including the tendency for awakened humans to seek the new, the unusual, to seek understanding for its own sake, behaviors that are far more a feature of a philosophic mode of consciousness and not a survival-and-reproduction mode. The migrations may well have also been undertakings seeking new or more copious supplies of psychoactive plants!

A catalytic awakening at the African source therefore becomes the default scenario. Whether the catalyst was one or more of the suppositions of Stringer et al., (language, genetic mutation, etc.) or instead the use of psychoactive plants in a collective, social environment is what remains to be shown. If the mainstream hypotheses can be discredited or shown to be unlikely, the remaining psychedelic hypothesis must be the default.

Mainstream Hypotheses Reinvigorated

In *Awakenings II* I discuss the claims of paleoanthropologists such as Chris Stringer and Spencer Wells that a trigger event in human social evolution was the key to understanding our rapid rise from a hundred-thousand-year (or longer) cognitive sleep.

Stringer's book and the other sources I mention are of course quite dated, given the volume of new information that continues to appear. But a recent entry in the field of popular evolutionary texts confirms much of what the earlier authors had proposed. The recently published *Understanding Human Evolution* by Ian Tattersall provides some important confirmations and updates.

For years, Ian Tattersall has been *the* go-to source for the latest facts and interpretations of human evolution. Here, in his clear, pithy style, he brings us up to date on the latest discoveries, weaving them skilfully into a

coherent outline of hominid history extending back millions of years." — Niles Eldredge, *Curator Emeritus in the Division of Paleontology, American Museum of Natural History, USA*

Tattersall writes, in Chapter 8 of *Understanding Human Evolution*: "The Emergence and Spread of *Homo sapiens*"

More generally, the message deriving from the story told in this book is that we modern human beings have an astonishingly recent origin, and a sudden one. In evolutionary terms, we acquired our extraordinary symbolic reasoning capacities virtually overnight, and we did so *exaptively*... rather than adaptively... [8](#)

This claim of exaptive change is important, and promotes the argument that psychoactive use did not caused a mutation to the physical, genetic, neurological makeup of proto-humans as has been suggessted by some, but was truly a psychological awakening for a physical being already prepared to encounter such an event. To say it a little differently so as to stress the importance of this view:

Suddenly becoming aware of the hidden realm in plain sight involved no physical or genetic change in human anatomy for this anatomy had long been ready to provide the necessary vehicle for an awakening. Whereas before the awakening the neurocognitive ability was used for survival and reproduction, suddenly, seemingly at the flick of a switch, it was available for creative and symbolic behavior.

And, supporting many of my suggestions in previous essays (*Origins of Psychedelia I & II*, my chapter in *Dream on the Rock*), a few important quotations from Tattersall (Bold text mine):

Anatomically modern humans, when?

The best evidence for the early presence on our planet of fully anatomically modern humans comes from sites in Ethiopia. The oldest such intimation, now dated to as much as 233 kyr, is a fragmentary skull discovered by Richard Leakey's short-lived expedition to the Omo Basin of southern

Ethiopia in 1967. As reconstructed, this specimen bears the major hallmarks of *Homo sapiens*. ... Somewhat younger, but more complete, is an adult cranium from Herto, in Ethiopia's Middle Awash region (160 kyr...).

**BBC NEWS** WORLD EDITION

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Oldest human skulls found

By Jonathan Amos
BBC News Online science staff

Three fossilised skulls unearthed in Ethiopia are said by scientists to be among the most important discoveries ever made in the search for the origin of humans.

The crania of two adults and a child, all dated to be around 160,000 years old, were pulled out of sediments near a village called Herto in the Afar region in the east of the country.

They are described as the oldest known fossils of modern humans, or *Homo sapiens*.

What excites scientists so much is that the specimens fit neatly with the genetic studies that have suggested this time and part of Africa for the emergence of mankind.



Herto skull: Dated at between 160,000 and 154,000 years old

Genetic Evidence

The >200 kyr date for the first *H. sapiens* fossil meshes neatly with molecular studies that also converge on an origin of our species around this time. A 2019 mtDNA study, for example, suggested that the ancestral *H. sapiens* population lived in northern Botswana some 200 kyr ago, and that it began to move out of the area some 70 kyr later due to environmental changes. This is certainly not the last word on the subject, but it is part of an accumulating genomic literature that comfortably agrees on the timing, if not on the exact location, of [anatomically] modern human emergence.

A reminder here that what is being discussed is the emergence of anatomically-modern *H. sapiens*, not cognitively-modern, post-awakening

humans. Tattersall again, on the claim that anatomically-modern is radically different from the much later cognitively-modern:

Physical vs. Cognitive modernity

What should not surprise us, given the general lack of correspondence between the appearance of new hominins and new technologies, is the conservative nature of the stone tools produced by the newly minted *Homo sapiens*. We could certainly wish for a better archaeological record in this respect; but to the extent that behavior in the larger sense is reflected in technology, very early *H. sapiens* seem to have been behaving in much the same way as their own African predecessors and their contemporaries in Africa and elsewhere in the world. Members of the new species looked radically different from their closest relatives, but there is little suggestion that their visible distinctiveness corresponded with anything new in their lives.

So we see that the archaeological record itself attests to early, pre-awakening *H. sapiens* being cognitively little changed. This is due to the "evolutionary necessity" that I claim holds individual humans in check, enmeshed always in the habit-routine mode of consciousness, using his potential genius only in the most extreme situations. The change from physical modernity to cognitive modernity was indeed, radical.

Symbolic Behavior

In the second section of Chapter 8, "Symbolic Behaviors," we begin to understand what cognitively-modern humans exhibited that was new, changes that came about "breathtakingly fast". Tattersall writes,

Blombos and Pinnacle Point are not the only sites in South Africa to yield early evidence of symbolic behaviors; and an intriguing discovery at Sibudu Cave, on the country's east coast, was that of a 61-kyr-old bone needle, the first intimation we have of couture, another innovation that was made in Africa some tens of thousands of years before it appears in Europe. Following Sibudu times the African climate underwent a period of severe

aridification, and the continent's southern tip became depopulated by humans. But by this point symbolic *Homo sapiens* had already begun to move out of the continent and into other areas of the Old World where (unlike their nonsymbolic predecessors who had forayed unsuccessfully into the Levant), they rapidly displaced all the resident hominid competition, from *Homo erectus* in the Far East to *H. neanderthalensis* in western Eurasia. Those who remained behind were evidently equally unkind to their remaining nonsymbolic African competitors as well.

The émigrés took with them their new way of relating to the world; and their most dramatic symbolic expression, and possibly the greatest of all time, was the extraordinary tradition of geometric and representative cave art that began in Europe at around 40 kyr ago, and lasted for an astonishing 30 kyr even as different waves of people came and went. Such sites as Lascaux, Font de Gaume, and Chauvet in France, and Altamira and Covalanas in Spain, contain some of the most powerful yet graceful figurative art that has ever been created. Although we still know nothing about the exact motivations of the hunter-gatherers who produced it, that art was clearly loaded with the deepest symbolic significance. Indeed, the representational art was routinely accompanied by geometric symbols that are sometimes repeated at different sites, suggesting a standardized regional significance. All in all, as alien to ours as their lifestyles and cosmologies might have been, there can be no doubt whatsoever that those Ice Age artists were both in skill and in intellectual capacity the equals of anyone in our modern postindustrial society. What is more, their displays of artistic virtuosity were accompanied, from the very beginning, not only by abundant evidence of unprecedentedly sophisticated levels of social and economic organization, but by such expressions as musical instruments, plaques bearing notations, and some of the most delicate and beautiful carvings and engravings ever made. All these manifestations in some way involved their makers' desire to understand the world around them, and to explain their place in it, making it clear that in their broadest senses both the artistic and the spiritual were baked into the human spirit from the very beginning.

There we have it: the radical change from anatomically-modern but cognitively unawakened human existence to a post-awakening state of consciousness featuring symbolic behavior.

Tattersall again:

With early representational art now documented in both Asia and Europe from the period around 40 kyr ago, it is natural to inquire whether the two phenomena were independent local developments, or whether they might have had a common source. There is no way to be sure about this, but a best guess is that both stemmed from a single tradition that most plausibly originated in Africa, prior to the exodus of fully symbolic modern humans. Since both molecular and paleontological sources of evidence suggest that this exodus was underway by 70 to 55 kyr ago, the inference must be that representational art began in Africa not long after we find the first stirrings there of the symbolic spirit - despite a dearth of direct evidence that is most likely due to the continent's huge size and its under-exploration by archaeologists. And if that is the case, then the transition from a nonsymbolic human condition to a fully-fledged symbolic one came about breathtakingly fast.

Tattersall, as well as all the authorities I have read concerning human evolution and the sudden awakening of cognitively-modern man, have each ventured their own hypotheses as to what cause(s) might have been involved. As related in *Awakenings II*, although everyone expressing his opinion on the matter insists that the cause is still "mysterious", perhaps it was a "genetic mutation that changed the way our brains are wired", (Spencer Wells) or Chris Stringer and Robin McKie in *African Exodus*:

The nature of the trigger of this great social upheaval is still hotly debated, but remains a mystery at the heart of our 'progress' as a species. Was it a biological, mental or social event that sent our species rushing pell-mell towards world domination? Was it the advent of symbolic language, the appearance of the nuclear family as the basic element of human social structure, or a fundamental change in the workings of the brain?

None of the experts, of course, have ventured the possibility that it might have been the advent of the socially-structured use of psychoactive plants! Tattersall, as did Stringer above, suggests that symbolic language was the trigger. In section 3 of Chapter 8, "In the Beginning Was the Word", we read,

How can we explain this amazing transition? Well, we need to start with the recognition that no new way of doing things can be introduced until the necessary biology is there. You simply cannot function in a new way if you don't have the potential to do it. Accordingly, the structures and capacities underwriting symbolic cognition must already have been in place when humans began to behave in the radically new fashion. [Exaptation] And the only obvious event in which that capacity might have been acquired was the one, perhaps around 250 kyr ago, in which humans acquired their striking new anatomical specializations. ...

But then the new potential was recruited, by what was necessarily a cultural or behavioral stimulus.

"Cultural or behavioral"! That would surely include the advent of psychoactive plant use and the first stirrings of a shamanic tradition.

But Tattersall overlooks the obvious and opts for the spontaneous invention of language:

So, what was the behavioral stimulus that kicked a preadapted brain into working on a symbolic algorithm? Well, paleoanthropologists of sociobiological bent have long looked to the complexities of modern social behaviors. We are higher primates, the most intensely social members of an intensely social taxon; and we are able to read the minds of others in unusually subtle and detached ways that, some believe, were driven into existence by the dynamics of interaction among individuals in societies that were steadily becoming more complex. ⁹

However, such explanations not only pose such unanswerable questions as why the members of only one higher primate lineage became symbolic, but also describe a very gradual process that would have taken vast amounts of time to unfurl to the extent we see in modern *Homo sapiens*. If, indeed,

such a transition would even have been possible, given that mechanisms of this kind do nothing to address the qualitative difference between two ways of thinking that do not exist on the same continuum. The stimulus we are seeking not only acted extremely rapidly, but also involved a radical shift in cognitive function. And a much better candidate for that stimulus is the spontaneous invention of language.

But can language, the kind of language that enables symbolic perception, thinking, and behavior, appear *spontaneously*? Is not the development of language also "a very gradual process that would have taken vast amounts of time to unfurl to the extent we see in modern *Homo sapiens*"? And if the time frame is not "vast" it surely is not instant, like the advent of psychedelic use would be.

Tattersall again:

What makes language the best - if not the only - possibility in this context is that language maps perfectly onto symbolic thought. Like thought, language depends on a vocabulary of discrete symbols that can be combined and recombined, according to rules, to make statements not only about the world as we perceive it, but as it might be. And it is, indeed, virtually impossible for us to conceive of thought in the absence of language.

Tattersall is certainly not up to speed here. In KOSMOS I wrote:

Language is not at all the medium of the thinking processes that precedes symbolization, and which is a resonance to the habit routine and its analysis. Language as it is realized, or other forms of symbolization such as the production of gesture or music, perhaps also the expression of emotion via facial expression and general posture, are serial processes, yet the habit routine, the internal model of the world, is iconic. It is a Gestalt, a constantly changing and updated multi-featured, yet holistic entity not requiring elaboration through a serial process of point for point representation with abstract symbols as does language. Our basic thinking process is in terms of icons or Gestalts, holoprojections, which later, and sometimes very

laboriously, may find only incomplete and unsatisfactory expression through the symbolization processes. Consider this statement by Albert Einstein, describing the way he considered his creative thinking to occur:

The words of the language, as they are written or spoken, do not seem to play any role in my mechanism of thought. The psychological entities in my case are . . . visual and some of muscular type. Conventional words and other signs have to be sought for laboriously only in a secondary stage.

Einstein's view and similar ones from many other creative individuals have been collected in a paper by Robert Root-Bernstein and Michele Root-Bernstein: "Intuitive Tools for Innovative Thinking". This paper may be found online [here](#) and [here](#).

Tattersall:

We modern humans make all kinds of intuitive associations in our brains, it is true; but to explain them to ourselves as well as to others requires the intermediation of language. The many cultural achievements of other hominins show clearly that very complex behaviors may be generated intuitively, without the benefit of language; but behavior in the peculiarly modern human symbolic manner is, like our ability to reimagine the world, entirely language dependent. And there is good reason from linguistics as well as from archaeology and genomics to believe that language began in Africa, where the first intimations of symbolism are found.

Here Tattersall and I disagree. Language certainly began in Africa, but long before our cognitive awakening, and it necessarily developed slowly.

Thus, in my view:

Language also developed slowly over the long period of cognitive slumber between the genesis of anatomically modern humans until the awakening to symbolically-capable humans.

It's use, however, was limited by the same habit-routine imperatives keeping protohumans stable, in a survival-and reproduction mode of consciousness.

When psychoactive use first became a social phenomenon, language then surely developed in parallel, becoming more capable of symbolic expression at a fast rate as Tattersall suggests.

Concluding these observations, Tattersall has inadvertantly provided welcome support for my Psychedelic Awakening scenario, but of course he, nor any other anthropological authority, has not considered the possibility that the awakening was psychedelic! Tattersall chooses the spontaneous appearance of symbolic language as the trigger. Perhaps the reason is that he simply did not find any other possible candidate. I will excuse him from considering my own hypothesis, since no mainstream authorities would dare to do so!

The Effects of Psychedelic Drugs

Now if we could show how the effect of psychedelic drugs as we understand them today would be just the ticket for a Psychedelic Awakening, we would be much further along the road to a complete, if still speculative theory.

However "the effect" required must be a consciousness change that would make sense to the mind of a protohuman at least as much as how "the effect" works its wonders on us moderns. Much of what is described as happening to the psychedelic voyager of today is strictly culture-specific and so of little value for a proto-human awakening event.

Since this essay has suffered some significant mission-creep and become longer than intended, I will save further explanation of psychedelic effects for the next installment. But avid readers can get the entire low-down from my essay "[Psychedelic Elephant](#)"..., which however is a bit long and combative for the general reader. Awakenings IV-VI will present a slimmed-down and more concise version of my views on psychedelic effects.

Awakenings IV

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References

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- 1 [The gospel of Thomas](#)
 - 2 Since the days of Terence McKenna's *Food of the Gods* the popular term for such theories has been "The Stoned Ape Hypothesis" but I will not use the term since it trivializes the idea, relegating it to pop, or "hippy" culture and so not suitable for "serious" investigation. And as we will soon see, we are not talking about being "stoned" but something much more important, something illuminating. In addition, it was not an ape that awakened but a physically (but not cognitively) fully-developed human animal.
 - 3 "to see it" implies and requires that one *understand* what one is seeing, that one has an awareness of what one "sees" in a larger sense, that one already has a command of the necessary symbolic thinking and language as discussed below.
 - 4 Balick, M. J. and Cox, P. A., 1996, *Plants, People, and Culture – The Science of Ethnobotany*, Scientific American Library, pp.156-157
 - 5 Brown, Donald E., 1991, *Human Universals*, Temple University Press, p.6]
 - 6 *The Natural Mind*, Houghton Mifflin Company, Boston 1972
 - 7 See the discussion in *Awakenings II*, and the following discussion by Ian Tattersall
 - 8 Exaptation and the related term [co-option](#) describe a shift in the [function](#) of a trait during [evolution](#). For example, a trait can evolve because it served one particular function, but subsequently it may come to serve another. Exaptations are common in both anatomy and behaviour. <https://www.wikiwand.com/en/articles/Exaptation>

- 9 The Machiavellian Intelligence hypothesis of brain advances being driven by social requirements, including the advancement of language capability. Byrne, Richard W. and Whiten, Andrew, 1988, *Machiavellian Intelligence*, Clarendon Press, Oxford