



Essay Review

Ayahuasca Variations

by

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Review of *The Antipodes of the Mind: Charting the Phenomenology of the Ayahuasca Experience* by Benny Shanon, Oxford University Press, 2002; ISBN: 0199252920

What the Brain Does

Sometime within the past two or three years I came upon a paper by Eleanor Rosch (1997) in which she observed that “William James speculated about the stream of consciousness at the turn of the century, and the portrayal of stream of consciousness has had various literary vogues, but experimental psychology has remained mute on this point, the very building block of phenomenological awareness.” My impression is that much the same could be said about the recent flood of consciousness studies. The authors of this work tend to treat consciousness as a homogenous metaphysical substance. They are quite interested in the relationship between this substance and the brain but show little interest in the varieties of conscious experience, in how consciousness evolves from one moment to the next.

How is it possible, for example, that I may simultaneously prepare breakfast while thinking about consciousness? Even as I break an egg into a mixing bowl, add some pancake mix,

pour in some milk, and begin beating the mixture, I am also thinking about Shanon’s book, Walter Freeman’s neurodynamic theories, Coleridge’s drug-inspired “Kubla Khan” – and *then!* I look out the window and notice how bright and sunny it is. I have little subjective sense of *doing* this, then *thinking* about that, and then back to *doing* this, and so forth. These seem to be simultaneous streams of attention, like two or three interacting contrapuntal voices in a Bach fugue. If “the mind is what the brain does” (Kosslyn and Koenig 1995, p. 4) then the *conscious mind* flits from one thing to another in a most interesting way.

Walter Freeman (1999a, pp. 156-158; cf. Varela 1999) speculates that consciousness arises as discontinuous whole-hemisphere states succeeding one another at a “frame rate” of 6 Hz to 10 Hz. Each attention stream would thus consist of a set of discontinuous macroscopic brain states interleaved with the states for the other streams. As an analogy, imagine cutting three different films into short segments of no

more than a half dozen or so frames per segment. Join the segments together so that each second or two of projected film contains segments from all three films. Now watch this intercut film. Your mind automatically assigns each short segment to the appropriate stream so that you experience three non-interfering movies more-or-less at once. *La Strada*, *Seven Samurai*, and *Toy Story*, as it were, unfold in your mind each in its own context.

That is the mind in action. Yet, as Rosch has noted, cognitive science and consciousness studies have little to say about it. Benny Shanon's *The Antipodes of the Mind: Charting the Phenomenology of the Ayahuasca Experience* brings this neglect into sharp relief by presenting us with an account of the different modes of consciousness that emerge when one has taken ayahuasca.

Ayahuasca is a psychoactive drink concocted in South America that induces very strong visions. Shanon is a cognitive psychologist who stumbled on the practice by accident and became interested in the nature of these visions. He started systematically exploring the experience, often through rituals organized by indigenous animist groups and by more recent syncretic groups (the Church of Santo Daime, União de Vegetal, Barquinha), but also with less formal groups involving "independent drinkers" and in sessions by himself. Shanon has participated in over 130 sessions himself and has interviewed 178 other users of which "16 were indigenous or persons of mixed race, 106 were residents of urban regions of South America, and 56 were foreigners (that is, persons residing outside South America)" (p. 44).¹

As the book's subtitle indicates, it is mostly an extensive investigation of what happens once one has ingested the brew. Much of it consists of more or less richly annotated lists of the sorts of things one sees and experiences. Shanon is not interested in interpreting these visions in the way a literary critic or a Jungian psychologist would. Nor is he interested in explaining what happens in neural terms, about

which he has little to say. By the same token, he does not take these experiences at face value either. Ayahuasca visions generally impress themselves on people as sojourns in another world, a world that is at least somehow separate from the mundane world, if not ontologically superior to it (that is, more real). While Shanon feels the pull of such a view, he knows that it is not appropriate to a scientific study. Whatever is happening, it cannot usefully be explained by appeals to the supernatural.

Another World

While one can drink ayahuasca alone, most users seem to drink it in the company of others, with a particularly experienced person presiding. If the group is a religious one, then the whole proceeding will follow prescribed ritual, which often involves collective singing and sometimes dancing as well. The music paces the unfolding visions and shapes their content (p. 189):

The tempo and rhythm of the music one hears is often reflected in one's visions. Notably, the music determines the rhythm and movement of figures in visions as well as the rate of change between images. Thus, the circles of light one commonly sees when intoxicated often pulsate to the rhythm of the singing one hears and are co-ordinated with the movements of one's body in dancing. . . . the chanting of *ayahuasqueros* [session leaders] is sensed as directing the course of the visions of those who listen to it and as determining their general flavour and colouring.

I can't help but being reminded of *Fantasia*, though the music there is purely abstract, whereas ayahuasca hymns have lyrics.

One generally remains still during the visions, which may happen with one's eyes closed (most common) or with them open. It is even possible, though rare, to split the visual field (p. 200):

A Brazilian with extensive involvement with Ayahuasca told me that he once experienced a split of his visual field. On one side, he had powerful visions; on the other side, he observed the real world around him, just as it was. Further, he could navigate between the two realms and readily shift between observing the visions, on the one hand, and acting in the real world and interacting with other (actually present) persons, on the other hand.

By and large, the content of these visions can be anything known to the visualizer – incidents from their personal life, natural and human history, culture and geography, mythology – and much that seems invented.

Shanon lists the following types of visual scenes (p. 293), all of which are discussed (the numbered list is Shanon's, the explanatory comments are mine):

1. Bursts, puffs, and splashes of colour.
2. Repetitive, multiplying non-figurative elements.
3. Geometric designs and patterns.
4. Designs with figures. [Figures are visual elements that look like things, plant, animal, human, and so forth.]
5. Rapid figural transformations
6. Kaleidoscopic images.
7. Well-defined, stable, single figurative images.
8. Proto-scenes.
9. Full-fledged scenes.
10. Interactive scenes. [The visionary has limited interaction with things in the scene.]
11. Scenes of flight. [The visionary is flying over the scene and has a subjective sense of flight, though he or she is, in fact, immobile. One may become transformed into a bird.]
12. Celestial and heavenly scenes.
13. Virtual Reality. [One moves from being a spectator to full immersion and ac-

tion in the scene.]

14. Supreme light.

Shanon goes on to assert (p. 296):

. . . not all types appear in all sessions. The most common types are (1), (2), (3), (5), (6), (7), and (8). Next in line is type (9), whereas types (10), (11), (12), (13), and (14) might not be reached at all. . . . Overall, types (1), (2), and (5) are characteristic of the beginnings of sessions. Types (6), (7), (8), and (9) are usually associated with the middle part of sessions. . . . Types (11), (12) and (14) are characteristic of the later part of sessions.

By and large, the more complex and sophisticated visions require experience with ayahuasca. One has to learn how to deploy the drug's visionary power. The ability to act in a scene comes with experience. Note, however, that while one can act in scenes, and even become fully immersed in them, one cannot will images or scenes into being (p. 307).

Experienced users come to think of the drug as a teacher and ayahuasca sessions as lessons offering insight into personal, cultural, ethical, political, and metaphysical matters. Traditional healers may encounter "beings who instruct them how to go about treating their patients" (p. 173). Beyond the visions, one often feels great empathy for and insight into the people with whom one is sharing the ayahuasca ritual.

Some Temporal Effects

While visions seem to be the most salient effect of ayahuasca intoxication, it also has profound temporal effects, to which Shanon devotes a chapter (pp. 226-241). Thus he reports that, in his first session he "decided to be cautious and close my eyes for only a limited period of time. Feeling that so much had happened, I reopened my eyes only to discover – by looking at my watch – that barely two minutes had elapsed" (p. 227). His subjective sense of flow had been altered; sometimes time seems

to speed up, sometimes it seems to slow down (pp. 230 ff.). The most interesting effect, however, is that “drinkers may feel that they are altogether outside time” (p. 234), that “they have experienced eternity” (p. 236; cf. Benzon 2001, pp. 164-166).

Rather than reviewing Shanon’s discussion of these temporal effects, however, I want to consider a specific observation that may afford some insight into the underlying neural processes (p. 314):

Abruptly, I moved my body (for instance, in order to check my tape recorder) and found myself out of my previous meditative balance. With this, my inner visual field was inundated with repetitive non-figurative elements whose overall contour traced the pattern of my movement.

Why should abrupt movement have this effect, both to wipe out the ongoing vision, whatever it may have been, and to replace it with abstract visual elements tracing that movement? While I certainly do not know what is going on, an obvious speculation suggests itself.

That suggestion is grounded in the sensory requirements of physical movement. Given that our eyes move as we move, it follows that the visual world will change in a way that is precisely matched to our path of motion. As we move straight ahead small distant objects will become larger and larger, thereby taking up more and more of our visual field, until they reach their maximum apparent size and then disappear off the margin of the visual field. Similarly, if we move our head to the right, say, to track a running horse, stationary objects will move to the left in the visual field while the horse itself will be relatively stable in the center. Since organizing a sharp visual image takes precious fractions of a second, the brain primes the visual system for these movements by sending *preafferent* signals anticipating the visual effects of our movement (Freeman 1999a, 1999b, 2000; cf. Gibson 1979, 206 ff., 227 ff.).

I suggest that what Shanon is seeing during these abrupt movements are these anticipatory preafferents, which are generated as part of the act of movement. That is why those abstract visual elements track his movement exactly; they were generated to do just that. So, even as his brain directs his body to move, it also generates anticipatory signals to the visual system and these signals wipe-out whatever vision had been evolving to that point.

Assume this speculation is correct. As formulated, it is, at best, only a first step toward an explanation. For it does not tell us why, in these circumstances, he should see those preafferents. Normally they are invisible. You can test this by sitting comfortably, closing your eyes, and then standing up. Do you see lights in your visual field that track your motion? I do not. When I close my eyes I see a faint negative after-image of the scene that had been in front of me. When I stand up, that after-image remains fixed in my visual field. Ayahuasca changes that, but we do not why or how that happens.

Let us now push this line of speculation a little farther. We know that both animals and humans make extensive use of dead reckoning (also known as path integration) in navigating from one place to another (Golledge 1999, Redish 1999). In dead reckoning you estimate distance traveled along a given heading as a function of velocity and elapsed time. Dead reckoning thus requires accurate time-telling. However, during ayahuasca sessions body movement is minimized. One might travel great (virtual) distances in visions, but that travel happens without the legs walking or running anywhere. Thus a critical component of the navigation system is non-functional. Could this affect one’s subjective sense of elapsed time?

I do not know. Shanon does not himself discuss this; but he does cite rather different but classic work by Fraise, Ornstein, and others on time perception. This work seeks to relate our subjective sense of time to information load during intervals of elapsed time. Shanon finds this suggestive – for information load does

seem to change under ayahuasca – but not entirely satisfactory. It is in that spirit that I have offered my speculation about time and navigation. I think it is a useful starting point, but no more.

Beyond this I would like to suggest that anyone with a reasonable background in psychology will find their own points of entry into the material Shanon presents. It is rich and various, and will require us to construct a rich psychology.

Musical Performance

As I indicated in the beginning, music seems to be quite important in the ayahuasca experience. Where the experience is structured by formal ritual, music is a part of the ritual. The assembled celebrants will sing hymns together and will listen to music sung by leaders and others. Music shapes the visions.

Judging from Shanon's accounts, much of this music is prepared beforehand (though not necessarily rehearsed, Shanon does not say) – certainly that is the case with the hymns sung in standard rituals. But some of this music is improvised, and that is what concerns me now. In fact, what really concerns me is the similarity between the *dynamics* of ayahuasca experience, as Shanon has described it, and the dynamics of skilled improvisation – as I understand it from my own fairly extensive experience and as those dynamics are presented in the literature (Bailey 1992, Berliner 1994, Nettle and Russell 1998, cf. Benzon 2001, pp. 69-71, 93-95).

As you read the following statement by Shanon (pp. 351-352), recall Freeman's speculation that consciousness occurs as a series of discontinuous whole-hemisphere brain states:

. . . under the intoxication, drinkers may move back and forth smoothly between radically different states of mind. Such movement need not be either erratic or chaotic, and for the experienced drinker it may even have the feel of playfulness. As I have suggested earlier, I would liken it to surfing the waves of the sea, or a bird's

flight, or perhaps a musician's masterful playing (*sic*) of his or her instrument.

The surfing image conveys a sense that one is carried, that one only gives a nudge in this or that direction, allowing the board and the waves do the rest. That is certainly how improvisation feels when it is going well – and by that I mean routinely well, what an experienced player can achieve at will. You head off in this or that musical “direction” and expect hands, breath, and fingers to take care of all the details automatically; you do not have time to think things through at the level of specific notes and phrases. Further, you intend to *hear* certain sounds rather than intending to execute certain motor actions. Motor execution is automatic. It is only when something goes wrong that you may start thinking about what your lips, hands, lungs, and feet should be doing.

Given musical knowledge, on the one hand, and a willingness to allow the music to happen, on the other hand, one can improvise. That willingness, that attitude, is as important as the musical knowledge. With that in mind, consider the following story Shanon tells about a private ayahuasca session:

In an amateur fashion, I have been playing the piano since childhood. I have played only classical music, always from the score, never improvising . . . Once during a private Ayahuasca session, I saw the piano in front of me. A score of a Bach prelude was there. I played the piece repeatedly and felt I was entering into a trance. Then, I left the score aside and began to improvise. I played for more than an hour, and the manner of my playing was different from anything I have ever experienced. It was executed in one unflinching flow, constituting an ongoing narration that was composed as it was being executed. It appeared that my fingers just knew where to go. Throughout this act, my technical performance astounded

me. At times, I felt that a force was upon me and that I was performing at its command. (pp. 220-221)

Someone who had been present during this performance remarked that “It seemed that the Muses descended upon you.” Shanon has subsequently continued to improvise without partaking of ayahuasca, though he remarks that “the quality of this playing is not like that under the intoxication.”

Now, compare Shanon’s experience with the following one, reported to me by an acquaintance:

I had a gig playing piano on New Year's Eve at the cocktail lounge of the most prestigious resort hotel in town. I took in my drum/bass machine, but had to play the house piano [which had an unusually sluggish action]. For the first half hour of the gig, I struggled with the molasses-like keys and was about to quit in frustration, when a man at the bar made a request for a tune I particularly like to play, Monk's “Round Midnight.” Suddenly I found that the same stiff keys that were giving me fits seemed to melt under my touch and I played with great feeling. The man left, but I continued on my roll; within a half hour, people who had stepped out of the main ballroom where a big band was playing began to gather around to listen and dance. This fueled me further and I was able to reach even greater heights of performance. . . . I was giddy with confidence and inspiration.²

This same person reported a similar incident at a band rehearsal. He was playing the “ride” or “jazz” chair in the trumpet section – that is, he was the player designated to take the improvised solos – as the band was rehearsing a new arrangement for the first time. When it came time for him to play a solo he noticed that he had lost the page on which the chord changes

had been written out; he thus had no choice but to play entirely “by ear.” It was some of the best improvisation he had ever done.

What these incidents have in common is that they involve experienced musicians playing in an unaccustomed way. It is clear that, in some sense, both of these men already had a certain capability in their heads and fingers, but did not ordinarily access it. My acquaintance was accustomed to improvisation, but his level of performance on these occasions was elevated above his norm. Shanon’s case is more extreme in that he had never before improvised; that is, he had never before assumed the attitude of an improviser.

It is not at all clear what made the difference for my acquaintance. Something just happened. Nor, for that matter, is it clear what happened to Shanon. Yes, he had taken ayahuasca; but we do not know enough about the brain and the drug for that information to count as an explanation of what happened. How did ayahuasca unlock the knowledge held latent in Shanon’s brain and fingers? How did it give him the *attitude* of an improviser?

Given the knowledge and the attitude, one finds oneself able to revise one’s musical intentions from moment to moment. Frequently notes come out that are not consistent with your current intention. You learn to put these “mistakes” to creative use by reconceiving the improvisation and sending it in a different direction (cf. Berliner 1994). Similarly, skilled improvisers pick up rhythms and phrases from accompanying musicians and incorporate them into their performance. In the extreme, one can even incorporate rude intrusions into the musical flow, as the following story about Wynton Marsalis illustrates (Hadju 2003):

He played a ballad, “I Don't Stand a Ghost of a Chance With You,” unaccompanied. . . . When he reached the climax, Marsalis played the final phrase, the title statement, in declarative tones, allowing each successive note to linger in the air a

bit longer. “I don't stand ... a ghost ... of ... a ... chance ...” The room was silent until, at the most dramatic point, someone's cell phone went off, blaring a rapid singsong melody in electronic bleeps. . . . Marsalis paused for a beat, motionless, and his eyebrows arched. . . . Still frozen at the microphone, Marsalis replayed the silly cell-phone melody note for note. Then he repeated it, and began improvising variations on the tune. The audience slowly came back to him. In a few minutes he resolved the improvisation—which had changed keys once or twice and throttled down to a ballad tempo—and ended up exactly where he had left off: “with ... you ...” The ovation was tremendous.

I do not know what Marsalis was consciously regarding when he heard the cell phone melody, but his decision to take up that melody has to have been a quick one. It may even have been made during the interrupting melody itself.

Let us return to Freeman's speculation that consciousness is organized as short discontinuous whole-hemisphere states. While Marsalis was improvising, almost all of those states would have been focused on the improvisation itself; if he was operating at a level of concentration that seems relatively rare, then all of those “frames” would have been given over to the music.³ When the cell phone jingle interrupted – during a brief pause in Marsalis's music – some of these conscious states would have focused on it. The decision to take up the jingle might have intruded on a state or three or its own, or it might have been blended in with states otherwise given over to the jingle. The decision would not have been a matter of explicit deliberation and planning; rather, it would have been more like a bicyclist evading an unexpected pothole than Gary Kasparov trying to out-think an opponent. Once the decision had been made the variations on that melody would have composed themselves all but automati-

cally. I would guess the whole process of arriving back at the concluding line of the original tune required relatively little deliberate intervention – most likely for the key changes Hadju mentions.

This same adaptability is characteristic of experienced users of ayahuasca. Thus Shanon reports (p. 346) that “when, during a session . . . I would wish to invest my visions with new momentum, I would open my eyes and look around. Closing my eyes again, the new perceptions from the real world would be incorporated into the images that appeared before me and further progressions in the visioning would be experienced.” In both cases, improvising and ayahuasca visions, a coherent flow is stitched together moment by moment. What is puzzling is how the overall flow can be coherent despite the sporadic presence of extreme discontinuities from one moment to the next. What is it that one has to learn – about music, the ayahuasca world, oneself – to be comfortable embracing the discontinuities?

Xanadu

Now let us take a brief look at the most famous drug-induced poem in the English language, “Kubla Khan” by Samuel Taylor Coleridge. Though all or part of the poem may have been written as early as 1797, when Coleridge published it in 1816 he provided it with a preface in which he claimed that a poem of “from two to three hundred lines” came to him over the course of a three-hour opium-induced reverie. During this process “all the images rose up before him as *things*, with a parallel production of the correspondent expressions, without any sensation or consciousness of effort.” Upon awakening he started transcribing the poem but, no sooner had he started, he was interrupted for about an hour. Upon returning to his room he discovered that “though he still retained some vague and dim recollection of the general purport of the vision, yet, with the exception of some eight or ten scattered lines and images, all the rest had passed away like the images on the surface of a stream into which a stone has been

cast, but, alas! without the after restoration of the latter!” The fifty-four lines Coleridge published are all that is left of the three-hundred line poem that came to him in this vision.⁴

For reasons that are too complex to review here, scholars have come to doubt the truth of various of the assertions that Coleridge makes in this preface. Yet Coleridge’s assertion that “the images rose up before him as *things*” is quite similar to the phenomenology of ayahuasca visions – though we should note that opium is quite different pharmacologically – as is the asserted fragility, that Coleridge was unable to reconstruct the full vision once he had been interrupted. The exotic nature of the poem’s content – a fantastic oriental garden and palace decreed by an Oriental ruler – is also consistent with themes and motifs Shanon has reported.

Beyond this we should note that “Kubla Khan” is unique in Coleridge’s output. His collected poems fill a single volume of almost 500 pages, and none of them are similar to “Kubla Khan.”⁵ However this poem came into being, Coleridge was not able to repeat that process. On the whole I am inclined to believe that he *did* have a vision and that this poem is what he was able to make of it. Perhaps the published poem was quickly written down more or less as published, as he asserted. But I can also imagine that he worked with the raw material quite a bit to give it final form. We have no strong evidence either way.

Turning to the poem itself, the first thirty-six lines (of fifty-four) present us with the world of Xanadu. It is laid before us, impersonally:

In Xanadu did Kubla Khan
A stately pleasure-dome decree.
(ll. 1-2)

So twice five miles of fertile ground
With walls and towers were girdled
round:
(ll. 5-6)

But oh! that deep romantic chasm which

slanted
Down the green hill athwart a cedarn
cover!
(ll. 12-13)

The shadow of the dome of pleasure
Floated midway on the waves;
(ll. 31-32)

There is no sense that the poet (that is to say, the voice that is producing these words) has any role in this world; it is simply there. This too is similar to many ayahuasca visions. The vision simply unfolds, scene by scene.

Things change dramatically with the beginning of the second part of the poem. There is an abrupt change of scene and we are no longer looking at Xanadu. Such change is, again, characteristic of ayahuasca visions. It is not at all clear where we are as the second part opens:

A damsel with a dulcimer
In a vision once I saw:
It was an Abyssinian maid,
And on her dulcimer she played,
Singing of Mount Abora.
(ll. 37-41)

The exoticism remains, but the poet has now entered the poem – “In a vision once I saw” – and will remain in it until the end. He goes on to assert that, if he could revive the maid’s song he would then use “music loud and long” (l. 45) to “build that dome in air” (l. 46). The performance would be so convincing that onlookers would actually see “That sunny dome! those caves of ice!” (l. 47). Notice that the priority of music over vision suggests the role that music plays in forming ayahuasca visions. The poet sings a song and the audience sees the things he sings about, namely the pleasure palace and the caves. These listeners respond by distancing themselves from the poet and his vision:

And all should cry, Beware! Beware!
His flashing eyes, his floating hair!

Weave a circle round him thrice,
 And close your eyes with holy dread,
 For he on honey-dew hath fed,
 And drunk the milk of Paradise.
 (ll. 49-54)

As this is but the hypothetical consequence of the poet being able to sing his song, it involves what Shanon has called a second-order vision. The poet (base vision) imagines what would happen if he became inspired (second-order vision). Shanon has had only one second order vision himself, and no informant has reported one. In Shanon's base vision (p. 103) he was in a palace where he met an person "whom I found impressive." This person invited him on an "adventure that . . . would involve a radical change in my state of consciousness." Shanon then imagines that adventure, making it a second-order vision within the base vision of the palace and the impressive man. In this hypothetical vision Shanon becomes transformed into a puma who is then devoured by other Pumas acting at the behest of the impressive man. Needless to say, the Shanon in the base vision declined the invitation to undergo this further visionary opportunity.

In both cases, the second-order vision depicts what would happen if a figure in the base vision (the poet, Shanon) went into an inspired mental state. In both cases the result was aggression directed against the inspired figure. In Coleridge's case the aggression is rather mild: the audience makes magical noises to protect themselves from the wild-eyed poet. In Shanon's case the aggression was far more direct: being eaten by pumas.

Above and beyond matter of thematic content perhaps the most interesting reason for looking at the poem is that it is highly structured. Shanon gives relatively few accounts of complete vision sequences, and the ones he gives are necessarily sketchy. Thus we have little sense of the exact time-course of an unfolding vision. Coleridge's vision is vividly realized and, above all else, the poem is elabo-

rately structured. Its temporal evolution is there on the page, awaiting our analysis. This is not the place to detail that structure, which is a long and often tedious task (see Benzon 1985 for details); but we can review some general aspects.

Each of the poem's two parts can be divided into three sections according to content. The first section of the first part (ll. 1 – 11) concerns Kubla's decree and is visual and spatial in character. The second section (ll. 12 – 30) is auditory and kinesthetic and is focused on a fountain giving birth to a river. The third section (ll. 31-36) is both visual and auditory. In a similar fashion, the second part of the poem also has a ternary structure. The first section is about poet's vision of the damsel (ll. 37-41); the second section involves the hypothetical creation of the "dome in air" (ll. 42-50); while the third section (ll. 51-54) gives the magical incantation of the poet's audience.

We can extend this structural analysis down a level, subdividing the three sections of the poem's first part into subsections and then doing the same with the poem's second part. We find that the two parts of the poem have the same structure at this level. Expressed in outline form, that common structure looks like this (with line numbers to the right):

	1st Part	2nd Part
A. First Section	1-11	37-41
1. subdivision	1-5	37-38
2. subdivision	6-11	39-41
B. Second Section	12-30	42-50
1. subdivision	12-16	42-44
2. subdivision	17-24	45-48
3. subdivision	25-30	49-50
C. Third Section	31-36	51-54
1. subdivision	31-34	51-52
2. subdivision	35-36	53-54

Notice that, just as the two parts of the poem are divided into three sections, so the middle sections of those three is itself divided into

three subdivisions while the first and third sections are divided only into two subdivisions. Given that the content of the two parts is so very different, this level of structural similarity is quite striking.

Thus the poem does not simply present us with one thing after another. Rather, the vision unfolds in scenes that have a rich hierarchical structure. Do ayahuasca visions have such structure?

What is even more striking is that that final line of the poem's first part recurs *in the middle of the middle* of the poem's second part:

Line 36: A sunny pleasure-dome with
caves of ice!

Line 47: That sunny dome! those caves of
ice!

If we think of the mind as evolving through some discontinuous set of states during line 36, what sequence of states does it evolve through during line 47? Is it the same sequence or not? I do not know, nor even know how to find out. That question arises naturally from a thorough analysis of "Kubla Khan" (see Benzon 1985); but that is only one of many questions arising from such analysis. What are the correlative questions to be asked about ayahuasca visions?

One could reasonably reply that there are no such questions as the situations are rather different. After all, Coleridge had not drunk ayahuasca, he had taken tincture of opium. Further, even if we believe that "Kubla Khan" reflects an opium-induced vision, we have no good reason to think the poem is a direct read-out of that vision. It may reflect a certain amount deliberate shaping by Coleridge. This does not necessarily mean, for example, that he self-consciously schemed to bring the poem's two parts into structural alignment; but he might very well have been guided by intuitions about aesthetic "rightness." Thus we have no positive reason to believe that this poem's complexity is a direct mirror of some complexity that evolved during a vision. It may or may not. We simply

don't know.

We do not know how the brain evolves from state to state under the influence of ayahuasca. For obvious reasons, we cannot get real-time accounts of ayahuasca visions; the very act of reciting what is happening would influence the experience. We do not have any second-by-second accounts of these visions.

So, the poem and the visions and the underlying mental acts are not directly comparable. But we can analyze and study the poem and people's response to it more readily than we can ayahuasca visions. While the ubiquitous PET scanners are too sluggish to capture information about moment-by-moment brain activity, we might be able to use EEG (or other) methods to obtain useful information about the brain activity of people as they read the poem themselves, or as they listen to someone recite it. We could then begin correlating that brain activity with the text of the poem and so begin to understand how the mind evolves such meanings from moment to moment. Once we get that far I cannot help but believe that we will have learned something that is applicable to unraveling the mysteries of ayahuasca, though I cannot predict what that might be.

Shanon argues that "the Ayahuasca experience is one of generation and creation. Rather than being a discoverer or subject to a passive process of discovery, the Ayahuasca drinker should be viewed as an imaginative creator" (p. 383). If this is so, then studying people's response of poems, such as "Kubla Khan," should give us clues to the workings of ayahuasca.

Sensing the Real

Perhaps the most puzzling aspect of ayahuasca visions, above and beyond their fantastic variety and detail, is their sense of being real (p. 65):

Often, the things I saw under the intoxication impressed me as being so real that the conclusion seemed to be unavoidable: truly existing other realities are being revealed. Believing that this is the case is

very common with the drinkers of Ayahuasca. Both during the course of the intoxication and afterwards the question repeatedly forces itself: Does this really exist? . . . The things seen with Ayahuasca often strike people as so different from anything they have seen or known that they cannot be the products of their own intellect.

Where does the sense of reality come from? How does the brain engender that?

This is the kind of question that drove Descartes: How can you tell that the scene before you is real, rather than being a phantasm placed in your mind by a malignant being? The problem is that there is nothing in the visual field that serves as a reality indicator. You cannot, for example, look to the lower left visual field and see flashing lights indicating reality status: one light indicating real perception, two lights indicating a dream, or three lights indicating a hallucination. Perception is not like that. One just knows that things are real, immediately and surely – and sometimes wrongly as well. Similarly, the ayahuasca voyager knows that the world of her visions is real, immediately and surely. Thus the sense of reality would seem to be an elementary sensation rather than the outcome of a sophisticated inferential process. Of what could such a sensation possibly consist?

I do not know, but Norman Holland (2003) has made a useful suggestion while considering a similar problem: Why is it that we invest literary works with sufficient reality that we often feel strong emotion in response to them? Observing that “brains serve one overarching purpose,” namely, “to move a body,” Holland goes on to observe that we are generally static when “absorbed in a movie or play or book” and that:

Reality-testing, it turns out, is also related to planning movement and action.

To intend to act, to plan a movement, we imagine the outcome. If I plan to move that glass of water on the table, I

have to imagine where it is going to be after I have moved it. I have to imagine what is not now true — a contrafactual. I understand where the glass now is — the reality of the glass—by noting where it is not. Having moved the glass, I know where it is by remembering where it was, again something no longer the fact.

We are now in the same conceptual territory we entered into when we began speculating about time, where we were concerned about sensory preference attendant upon moving. While I do not think we can leave matters rest there — surely there is more work to be done, both empirically and conceptually — I am content for now with the general notion that our sense of time and our sense of reality may be bound up in the same neural mechanisms, namely those responsible for moving us reliably from one place to another in a complex world.

If so, then one might think that, to understand the effects of ayahuasca, we need only understand how those mechanisms — surely they are ancient ones — operate. It may well be that the drug’s fundamental effects involve changes in only a few basic physiological parameters, but those changes cascade through the entire brain. One takes ayahuasca and *voilà!* the world changes. I suspect, however, that we will only understand how the whole world changes when we understand the whole of the brain in which it changes. That is a formidable task.

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Notes

¹*N,N*-dimethyltryptamine (DMT) is the major, but by no means only, psychoactive chemical in ayahuasca. It affects the brain’s serotonin system. There is a fair amount of information about ayahuasca available on the web, including first-person accounts of visions. Two places

to start exploring this information are Erowid and Lycæum:

<http://www.erowid.org/chemicals/ayahuasca/ayahuasca.shtml>

<http://leda.lycaem.org/Preparations/Ayahuasca.4445.shtml>

The Church of Santo Daime has a website: <http://www.santodaime.org/indexy.htm>

²This person had been a student of mine about a decade ago and the account is one he had submitted as part of his coursework. I have since lost touch with him and so have been unable to obtain his permission to publish his words here. I do note, however, that his account was circulated to everyone in the class and thus publishing it here does not seem to be a violation of privileged communication.

³I am, of course, guessing about this. My guess is based on my own experience and on various subjective reports I have read, a number of which are scattered throughout my book (Benzon 2001). In general, one's mind can easily flit about to other matters while one is playing. The more involved one is with the music, however, the less the mind flits about. Complete and utter absorption into the music seems relatively rare, but I do not know of any systematic attempts to gather a large corpus of subjective accounts that would support a more reasoned and subtle statement.

⁴"Kubla Khan" is available online; I recommend the lightly annotated version made available by the University of Virginia:

http://etext.lib.virginia.edu/stc/Coleridge/poems/Kubla_Khan.html

For a review and critique of the major interpretations of the poem, see Tsur 1987; Hogsette 1997 has an interesting approach to the poem's puzzling preface. Finally, you might wish to consult Book Four of John Livingston Lowes, *The Road to Xanadu* (1927). Here Lowes presents the results of his search through Coleridge's notebooks for the sources of themes and images in "Kubla Khan".

⁵"Kubla Khan" is often grouped together with "The Rime of the Ancient Mariner" and

"Christabel" as three "poems of the fantastic," which they are. The other two poems, however, are long narratives, and so are constructed quite differently from "Kubla Khan," though sharing its exoticism.

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