

Psychedelic Experience as a Heuristic Tool for Exploring the Mind and the Brain

Alexey Alyushin

Abstract

I discuss the ontological nature and heuristic value of psychedelic experience. I argue that psychedelic phenomena may manifest the activity of certain mental formations and brain mechanisms that otherwise remain hidden. Thus, psychedelic phenomena can be heuristic tools and intriguing objects of the scientific study. I consider two types of psychedelic phenomena in particular. The first is the moral cleansing that may accompany a psychedelic trip. The second is the appearance of visual and auditory hallucinations. I establish a unified explanatory ground for the phenomena that are commonly viewed as distinct in their genesis. I explain both types of phenomena as products of the amplified imaginative ability of the brain under a substance's influence. I suggest that the activation of imagination causes an increased empathy and thus accentuates moral feelings. I propose the hypothesis that hallucinations are mental objects of a quantum nature. I argue that no ontologically separate reality stands behind psychedelic visions.

Key Words: ethics; hallucinations; hallucinogen; imagination; mental imagery; psilocybin; psychedelic; quantum phenomena; self-observation

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I. Striving for objectivity and a scientist's subjective experience

My position is that all psychedelic phenomena can and should be explained scientifically. The task of the modern scientific researcher in psychedelics is to avoid the influence of esotericism and occultism because his subject is especially vulnerable to parascientific pressure. In this article, I consider some intriguing psychedelic phenomena, including those experienced by myself, and attempt to explain them by resorting only to natural causation.

After a nearly 40-year-long stagnation in scientific research on psychedelics due to government fears, a strong new wave of research has been on the rise since the end of the 1990s. Of the recent advances, I will mention one that is particularly close to my approach. It was confirmed under controlled conditions that something very important occurs in the human psyche under the influence of psychedelics, psilocybin in particular. The results of a study conducted by R. R. Griffiths and associates at the Johns Hopkins University School of Medicine likened the psychedelic experience to a mystical experience in its profoundness and life-shattering, primarily healing, aftermath (Griffiths *et al.*, 2006; 2008; 2011).

The mentioned study is important because of its widespread and positive public resonance. For the first time, a group of well-established scientists made an authoritative statement indicating that society should not

Corresponding author: Dr. Alexey Alyushin

Address: The Higher School of Economics, Department of Philosophy, 20 Myasnitskaya Street, 101000 Moscow, Russia

Phone: +7 (495) 772-95-90 *(ext.) 2682

e-mail: aturo@mail.ru

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despise psychedelics but should instead value them as a means of achieving revelations similar to those traditionally considered religious. A degree of academic approval was given to something formerly considered a vice. It is suggested, however, that all genuine, i.e., addictive, drugs such as alcohol, heroin, cocaine, and amphetamines should retain their social stigma.

I believe that the psychedelic experience can give scientists new and valuable information about the structure of the mind and the scheme of reality that is reflected in the mind. I consider psychedelic hallucinations to be interesting objects of study and useful instruments for scientific exploration. I think that the content of hallucinations can tell us much about traits and functions of the brain that are otherwise difficult to identify. However, I dismiss the idea of a 'separate reality,' that is, of a hermetic world with mysterious inhabitants to which entry can only be gained through psychedelics or altered states of consciousness. Psychedelics only make more apparent that which already exists in reality and which principally yields to verifiable observation. Psychedelics only expand the frontiers of the known reality; they do not lead to distinct separate realities.

After non-laboratory self-observation under psychedelics was criminalized in the mid-1960s even for scientists, a separation of roles became the only research method available. Under that separation, the person provides a first-person report on his subjective experience from the position of a supposed layman, while the scientist interprets the experience from the detached perspective of a pundit.

I contend that self-observation by a scientist of the influence of psychedelics is not a dubious or faulty method. On the contrary, first-hand experience is crucial to understanding the subject that the scientist intends to explore. Combining the two points of observation by one and the same person is more heuristic than the separation of roles. However, combining the roles is also complicating the task due to the contradictory requirements of nourishing one's intimate experience and dissecting this very experience in order to examine 'what's there inside.' Psychedelic hallucinations and

experiences are purely subjective occurrences, and, as such, they are inaccessible to any external registering device. The study of biochemical reactions and neurophysiological processes in the brain is the study of the objective events accompanying or underlying the experience, not the experience itself. Hallucinations are only visible within one's inner mental view. They exist nowhere else.

When controlled laboratory experiments have been used to examine the subjective experience of psychedelics in addition to taking objective measurements, the laboratory setting (often a hospital) has hindered or destroyed the experience itself. Thus, an authentic experience can be obtained only in an informal, comfortable setting, which makes self-experimentation and self-observation not only desirable but also necessary. Of course, collection and the subsequent collation of reports are needed to make the results of any single instance of introspection scientifically valid.

There is a clear touch of hypocrisy and even fear regarding one's academic status in the claim to be the purely objective recorder of the other's - not mine! - psychedelic frenzies. Even William James' experiments with nitrous oxide inhalation are scorned as childish pranks and amateurish curiosity by 'spiritually correct' clerics and psychologists, as if his *Varieties of Religious Experience*, which they should have studied in college as a classic, could have been born through some immaculate conception, without James's having had those very experiences (Nicotra, 2008). One of the only current international exceptions to the prohibition on self-experimentation is the use of ayahuasca in indigenous surroundings. Something is better than none, but the dependence on paternalistic benevolence of the rulers is a pitiable situation indeed for Western science 500 years away from the 'Dark Ages'.

Personal knowledge of the subjective effects of hallucinogenic substances is considered indispensable among professional laboratory researchers, although they do not advertise this publicly (Langlitz, 2010). That even well-established researchers pretend to dwell in an ivory tower of objectivist detachment is not their

flaw but the flaw of a hypocritical society. One can hardly be a geographer and say that he personally dislikes and condemns traveling. Overcoming this inveterate hypocrisy is a part of my plea for a scientific approach to the study of psychedelics.

An independent, open-minded explorer is stuck between the two communities. On the one hand, the mainstream academic conservative majority supposes by default that psychedelics are wrong and inarticulately advises to be cautious with the theme of drugs. On the other hand, the bigots who exalt the 'mysterious' in psychedelics would rather indulge in their fantastic occult worlds than place their experiences under sober and rational investigation. While navigating between these two extremes is difficult, it is the only productive way to approach research on psychedelics.

II. Moral cleansing: first-hand experience

The catharsis that occurs after the peak of a psychedelic trip can involve a moral cleansing of a person's inner world and a rethinking of one's close personal relationships. I have experienced this effect myself. I will first describe the experience in detail, after which I will propose a tentative explanation for the mechanism of the effect.

This trip was my first on psilocybin mushrooms. It happened when I was nearing my forties. The trip undoubtedly had a strong spiritual healing effect on me. I had tried mushrooms several times before, but the standard dose for legal sale in the Netherlands at that time, 3 grams of dried mushrooms, did not affect me. Therefore, I decided to double the dose to 6 grams of *Psilocybe cubensis* powder. I think my case was a model one because, at a grown-up age, my life impediments had ripened such that they could be effectively detected, and I became mature enough to recognize their causes. My previous relatively little experience with drugs combined with the choice of an unambiguously powerful dose also benefited me by overwhelming me and leaving me with no chance to avoid facing difficult inner problems.

After six or so hours of tripping, I woke up with only one idea filling my head:

the first thing I should do now is to call my mother and say some tender words to her. I was shown during my trip that I had been unjust to my mother, who cared for me, that I was the only happiness in her life, and that I should overcome my fixation on a seemingly unshakeable disgust of her. I had a very good talk with my mother a month later. As if untying a knot, normalizing my attitude toward her allowed other repairs to take place. This advancement encouraged me and showed me that I had moral command over myself. I substantially reduced my drinking and, in a few years, completely gave it up.

The vision I clearly remember, one of many that rushed through my mind, was of my young mother lying bent on her side, and me as a baby lying in a space formed by her lap, bosom, and elbows, with her tenderly talking to me. An unfamiliar voice of the 'alien creature' type, which will be discussed further, persuaded me to care for her. The whole scene was viewed as if from the ceiling and was very realistic in the concrete visual details.

What the persuasive message generally conveyed to me was that I should not do harm to the people who are close to me and who depend upon me. I was prompted to behave morally. This may sound trivial, but for me, who was used to fostering childish resentment toward my family and to defying others, this was a revelation. I had been aware of a lingering ailment in my psyche long before, but without a push from the outside, I surely would not have been able to improve as much, as swiftly, and by such subtle means.

Of course, I was amazed by the effect of the psychedelic. I insist on using the passive voice in describing how the process was perceived by me. There was a distinct feeling of having been placed on an operating table, with some search radar like that of a computer antivirus program starting scanning your entire spiritual realm. The radar was unerringly spotting the malfunctioning regions for further recovery, one of such regions being my neglect of my mother.

III. The Rise of empathic abilities

By conveying my own account, I wish to evidence that the effect of moral reevaluation under psychedelics is completely real, impressive, and far-reaching. This effect is reported by many independent observers. Hence, there must be non-random causes of this phenomenon that merit scientific exploration. In this section, I present some explanatory considerations on the mechanism of the effect.

My general observation, which is based on the experience described above and on additional trips, is that psychedelics greatly enhance the empathic ability to understand other people and even other living beings and to respond emotionally to the injustices and disappointments that others may encounter. In the psychedelic state, it is much easier to put oneself in the position of other creatures than while in the normal state. One has a finer understanding of the feelings of others, and one intuitively senses otherwise unnoticeable modulations in others' moods and communicated meanings. In this state, a person who is physically remote may seem to be nearby and to understand you wordlessly.

In *The Theory of Moral Sentiments*, the famous 18th century moralist and classic author of political economy Adam Smith suggested that imagination is the source of sympathy to another person and that sympathy is the ground for morality. During Smith's lifetime, the word 'empathy' did not exist in the English language; it was derived from the German '*Einfühlung*' in the beginning of the 20th century. What Smith meant by 'sympathy,' however, is what 'empathy' means today.

In respect to a man who is suffering pain, he writes, "by the imagination we place ourselves in his situation, we conceive ourselves enduring all the same torments, we enter as it were into his body, and become in some measure the same person with him, and thence form some idea of his sensations, and even feel something which, though weaker in degree, is not altogether unlike them" (Smith, 1982; p.60).

To explicate how imagination facilitates empathy and how empathy in turn engenders altruism, morality, and striving for justice, Smith introduced the notion of

the 'impartial spectator.' According to this notion, man is able to imagine himself in a position that is not specific to any particular individual. Thus, man acquires the perspective of dispassionate justice, when his ego and wellbeing are not perceived as prevailing over that of any other.

It is reason, principle, conscience, the inhabitant of the breast, the man within, the great judge and arbiter of our conduct. It is he who, whenever we are about to act so as to affect the happiness of others, calls to us, with a voice capable of astonishing the most presumptuous of our passions, that we are but one of the multitude, in no respect better than any other in it; and that when we prefer ourselves so shamefully and so blindly to others, we become the proper objects of resentment, abhorrence, and execration. It is from him only that we learn the real littleness of ourselves, and of whatever relates to ourselves, and the natural misrepresentations of self-love can be corrected only by the eye of this impartial spectator. It is he who shows us the propriety of generosity and the deformity of injustice (Smith, 1982, p. 166). [...] The man within the breast, the abstract and ideal spectator of our sentiments and conduct, requires often to be awakened and put in mind of his duty (Smith, 1982, p. 178).

Smith's conception of the origins of morality helps explain why moral sentiments are enhanced when the imagination is activated in the psychedelic state. The conception thus provides common explanatory ground for two seemingly distinct psychedelic phenomena. Little effort is required indeed to link the appearance of perceptive hallucinations to the increased imaginatory activity of the brain. However, it is hard to believe that only the imagination might cause the deep moral reassessment of one's life. Isn't it a phenomenon of a different genesis, one that involves some external indoctrination? – might be suspected quite justifiably.

My stance is that the phenomenon of moral remorse occurring under psychedelics can also be traced to the chemically-induced activation of imagination. There is no external agency involved here, only the arousal of the 'man within' - the 'impartial spectator.'

Max Scheler's notion of 'spirit' as a mental entity which presence distinguishes human from animal also comes to mind here. The essence of 'spirit' is the ability to detach itself from biological instincts and self-centered ego. Scheler introduced his concept of 'spirit' in *The Human Place in the Cosmos* in 1928 (Scheler, 2009). I believe that Scheler's 'spirit' is a mental entity that is ontologically similar to that described by Smith as the 'impartial spectator'.

This entity is an inherent part of the mind, so its action upon personality occurs through self-suggestion rather than through the outside inspiration. Mystic and alien as the persuasive voice under a psychedelic may sound, it is nothing else than the 'inner voice' that one commonly encounters in the normal state. The voice of one's conscience is always inherently present, though in the altered state its appeal becomes much more distinct and hypnotically suggestive.

My experiences acquired from the trips that followed that first one were less rapturous. I would say that the profound moral revelation induced by the psychedelic state seems to happen only once. It resembles the act of imprinting in biology, although it imprints not the instinctive patterns of behavior, as in the case of baby animals, but the particular demands of conscience. I am unsure as to the basis for the uniqueness of the event. Either the mind learns to resist further interventions of such shattering profoundness, or after the initial purge, there remains nothing equally important in the soul for further purges of that scale.

I discovered that however mesmerizing the inner voice of the conscience may be under the influence of a psychedelic, one would not follow its demands in life unless intrinsically ready to do so. I will mention fragment of another experience with psilocybin that occurred several years after that first. During this new trip, I realized as completely self-evident that I should not turn away from people begging in the street, as I regretfully always do. I felt how they all need warmth from other people, and how happy I can make one of them by lending him some money and, more importantly, by manifesting my concern. The empathic state was so convincing that I

literally swore to myself that I would give alms and compassion to all beggars from that point on. So what do you think? Within a day or two my desire vanished, giving way to rational everyday behavior. I stepped back not out of greed or callousness. Rather, I felt that internalizing the sufferings of others would drain and exhaust me, and that my nervous system needed some layer of defense so that it would not dissipate. By no means did I give up helping others; rather, I realized that the demand to help cannot be taken as a depersonalized compulsory principle.

I provided this new example contradicting the first one in order to create a realistic picture of how moral decisions are made under psychedelics and then translated into everyday life. Moral decisions only seem to be absolute. It is not possible to hide behind psychedelics; one will inevitably return to his normal state of mind. However, the psychedelic experience, like other extreme life experiences, is effective in elucidating which values are held seriously and which are unimportant or even detrimental to one's life.

The question of why moral sentiments are enhanced in the psychedelic state is only one aspect of the general question of why moral sentiments are so enduring and persuasive. The real topic is the nature of morality itself, whether expressed in an altered state of mind or in a normal state. Empathy is an important component, but the research should involve other aspects as well. These include altruistic instincts on the biological level and the realization of moral demands on the level of sociality. Transient abnormality is merely a route to understanding the normal and the universal in the human nature.

The force of moral suggestion during the trip (especially the first trip) is so strong and the impression of communication with some above-standing conscious entity so realistic and astounding that one tends to believe that it is a deity or the sacred that he has got in touch with. For some time after the trip, it is common to continue to feel reverence to any human being and to life in general. I am not at all religious, I am rationally and scientifically oriented, but this feeling has filled me up too.

In seeking only natural explanations for the moral cleansing phenomenon, I do not mean to undervalue its personal importance. That a piece of fine art is drawn by the chemically analyzable paints doesn't mean that its impression on the soul is likewise only 'chemical'. Human is striving for finding the sacred for himself anyway. So if to look for an entity deserving being acknowledged as the sacred in the most realistic and substantiated terms, then our inner mental entity of 'spirit' and the 'impartial spectator' appear to be the most valid candidate.

It is the human spirit that should be cherished as the precious asset and the sacred heritage of the whole mankind's development. The psychedelic experience is worth because it exposes the presence of spirit most lucidly. Engendered as only a product of natural evolution, the spirit (or the reason, or the consciousness – there is no generally agreed upon single term) – appeared to be an emergent entity that started its own line of determination and is bound to guide the further ascent of the humanity.

In the next sections, I consider the mechanism by which psychedelic hallucinations occur. I explain the origin and content of hallucinations using a naturalistic perspective, as I did when discussing the ethical experience. I argue that hallucinations are the products of mental imagery in our brains. They are not manifestations of some separate reality or messages from alien beings, as esoterically oriented people, including some scientists, tend to believe.

IV. Origins of hallucinations: an overview of the recent relevant research

Concerning the brain mechanisms that cause hallucinations, three questions are appropriate: Why do hallucinations appear at all? Why are images so detailed and elaborate? Why does one particular image appear and not another? In putting those questions, I am primarily referring to the closed-eyes visual hallucinations. Unlike open-eyed visuals, they are not influenced by or entangled with images of external objects, so they more precisely manifest the manner

in which the brain generates images when left on its own.

I will briefly review the state of modern research on the origins of hallucinations and then present some additional explanatory suggestions of my own. Hallucinations have mostly been explored in relation to schizophrenia. Psychedelic drugs are believed to simulate many of the symptoms of schizophrenia. Thus, many findings from the two fields are assumed to be mutually applicable.

The origins of hallucinations are believed to be closely linked to the mental imagery function of the brain. It is believed that the brain uses its mental imagery function to generate perceptive predictions. As M. Bar stated, "rather than passively 'waiting' to be activated by sensations, it is proposed that the human brain is continuously busy generating predictions that approximate the relevant future" (Bar, 2007; Kveraga *et al.*, 2007). Moulton and Kosslyn argued "that the primary function of mental imagery is to allow us to generate specific predictions based upon past experience" (Moulton and Kosslyn, 2009; p.1273).

M. Bar denoted the mechanism of perceptive predictions as the proactive function of the brain. The notion of top-down expectations as complementary to bottom-up inputs is also used by some scientists to describe the phenomenon. Another complementary pair of categories is the reflective function vs. the anticipatory function of the brain.

To construct a generalized descriptive formula using the concepts mentioned above, it is possible to assert that proactive anticipation facilitates the recognition of new incoming perceptive data by assimilating these data more easily and quickly with the help of cognitive patterns molded by previous experience. Hallucinations might be viewed as a mismatch between the anticipatory imagery templates within the brain and the perception-based data that are processed by our sensory organs. As G. Brébion *et al.* reported, "our data suggest that visual hallucinations are associated with confusion between visual mental images and perception" (Brébion *et al.*, 2008; p.383).

Precisely what type of ‘confusion’ might be involved here? S. Grossberg suggests that “top-down expectations, in the absence of supportive bottom-up inputs [can] cause conscious experiences of imagery and inner speech” (Grossberg, 2000; p.583). A. Aleman *et al.* (2003; p.175) stated that hallucinations “result from an increased influence of top-down sensory expectations on conscious perception.” Hence, hallucinations seem to be the result of an imbalance of inward and outward signals, wherein the overabundant flow of perceptive templates is not matched by external stimuli. Outward perceptive templates are overproduced and self-overexciting such that, metaphorically speaking, they choke on themselves.

Assuming that the overabundance of mental imagery generates hallucinations, it would logically follow that the more vivid the mental imagery a person normally experiences, the more predisposed he is to hallucinations. However, the experimental results do not support this logical assumption. Aleman *et al.* (2003; p.183) found that their results “strongly suggest that patients with hallucinations do not have a trait-like alteration of mental imagery that may eventually lead to the emergence of hallucinations.” Oertel *et al.* reported similar experimental results: “vividness of mental imagery was independent of predisposition towards hallucinations” (Oertel *et al.*, 2009; p.1).

A. Aleman *et al.* (2000; p.830) attempted to explain hallucinations as a deficiency of reality discrimination rather than as a product of overly vivid mental imagery. They stated that

“although vividness of mental images may be subjectively associated with mild hallucinatory experiences, we suggest that cognitive processes associated with reality discrimination rather than increased perceptual characteristics of mental images may play a role at the information processing level.”

Experiments conducted by Spitzer *et al.* (1996) showed that under the influence of psilocybin and presumably other psychedelics, the associative net broadens. Hallucinogens increase the availability of remote associations. The content is brought to mind that, under normal conditions,

would remain outside of the associative net. The authors experimentally demonstrated that semantic priming activation spreads further and faster in thought-disordered schizophrenics and psilocybin users than in normal volunteers. Therefore, remote mental associations become more available to these two groups.

On the basis of Spitzer’s experiments, how can it be explained that the creative widening of an associative net may enter into hallucinating as already a malfunction? Consciousness goes on broadening as the net of associations widens; then at a certain stage this creative broadening breaks up into a qualitatively antagonistic state, in which disjunctions in consciousness and erroneous attributions of meaning appear. Now, completely unrelated events and objects begin to be perceived as forming a unity, which is no more creative, only disruptive.

V. Hallucinating as gaining access to the domain of mental imagery

Taking into account the aforementioned explanations, I now present some additional suggestions as to the why hallucinations appear. I refer to the ‘appearance’ of hallucinations to stress that some aspect of the hallucination exists before its overt manifestation. In my understanding, what is critical in the appearance of hallucinations is neither the overproduction of mental imagery nor a deficiency in reality discrimination. I suggest that the abnormal state causes the withdrawal of the neurophysiologic shield that, in the normal state, prevents latently-processed mental imagery content from entering the conscious sphere. A brain malfunction makes the barrier between the conscious and the unconscious permeable, providing mind-controlled access to normally latent mental imagery brain function.

By the ‘shield’, I mean a functional unit that, evidently, should exist in the perceptive data processing scheme in order to prevent two parallel streams from becoming mixed. The first stream maintains the finalized output picture that stands for the reality and should not contain the remnants of the technologies, through which the brain weaves this picture. The other stream provides for that whole mental

imagery false work and footage out of which the output picture is fabricated.

Hallucinating is like taking the lid off a cooking pot, which allows one to encounter a myriad of semi-manufactured perceptive scraps. My important point, however, is that by intruding into the content of the mental imagery domain, the observer not only interferes with that imagery but also participates in creating what he sees.

Evolutionarily, the animal brain may have developed its mental imagery function for several purposes. First, the manipulation of previously stored images might be used in recognition, namely through singling out an invariable image skeleton from its multiple perspectives and then matching the skeleton to a new snapshot of the same object. Second, the generation of new images might be useful for the mental projection of the possible positions and trajectories of bodies. Memorizing perceptual blanks and fitting probes not only litters visual memory but also provides an associative net with many branches for faster recognition.

Social interaction and symbolic regulation among humans is a third factor that may also have contributed to the development of the mental imagery domain. Because imitating adult behaviors is important for the social learning of a child, mirror neurons have developed in the brain. Further, adults must have the capacity to imagine how other members of their society would perceive their behavior. In addition to perceiving other individuals and objects, the human mind gained the ability to simulate others' view on oneself. This virtual perspective was deeply implanted in the human mind in the course of evolution and eventually became the chief attribute that distinguishes humans from animals. It is this mental entity that was designated by Smith as the 'impartial spectator' and by Scheler as 'spirit'.

The following anonymous report is one of many that illustrate that perceptive images of external objects can be consciously and voluntarily transformed in the psychedelic state. The ability to manipulate perceptions supports the idea that hallucinating is akin to the probing manipulations with mental imagery

templates that the brain performs automatically all of the time.

I believe that I am in control of the hallucinations. I perform the following test to see if this is true: ... I turn away from the mirror and try really hard to convince myself that I have a well-built chest. To my surprise, the image in the mirror has now changed to verify this fact. ... 2-CI [a type of synthetic drug – the author of the article] seems to give one extraordinary freedom of control in creating images. ... One has to think of how something is or how something is happening in order to be able to see it (Anonymous report, 2004).

In some cases, I managed to willfully steer my closed-eye hallucinations. This image steering proceeded in the following manner. Out of a knob in the center of my viewing field, the image of some object unintentionally arose. It came closer, slowly turned in different directions, then blurred and vanished within 10 or 15 seconds. I then started to create the images consciously. I thought to myself, let me summon a man's face now, a cross, a naked woman's body, a corpse, the Earth, etc., and the respective three-dimensional objects arose in full detail. Then I thought, "let it turn to the left," and it turned to the left, or "to the right now," and it turned to the right. Summoning the desired object sometimes required substantial conscious effort and it was not always successful. I believe that in this state I got the rare ability to consciously participate in what my brain routinely executes all the time, although then beyond my consciousness and will.

In my normal state, I can create any images in the mental imagery sphere. However, they do not pop up by themselves if not consciously summoned and, if summoned, they remain bleak and indistinct. I suspect that mental imagery is involved in abstract thinking as well. My own non-verbal thinking, including abstract thinking, proceeds in the form of (or is accompanied by) replacements and reconstellations of some vaguely discernible icons. The icons are obtained as if by repeatedly drying out the objects' content to produce the condensed clots of fabric that would visually represent essences, abstractions, and meanings.

Visual hallucinations are rich in fine details and concrete. If there is a castle, it is a castle with four towers, not two or 'several,' with cocks on top, not knights or 'decorations.' Why is this so? Why does the brain engage itself in so thoroughly elaborating the detail of these scenes, in providing the pictures with such concreteness, given that all of them are only fictitious?

Earlier, I suggested that hallucinations are manifestations of the brain's mental imagery machinery. If this were the case, it would seem that leaving the template vague, generalized, and unfinished would be more functional for mental imagery tasks. Leaving the picture blurred would increase its ability to match further probes, which is the purpose of the proactive function of the brain. The precision of an image, its burdening with a multitude of details, narrows its applicability to other contexts. The more finished the image's concrete details are, the less open it is to any further cognitive matching. Thus, it makes sense for mental imagery to stay generalized and approximated as a set of abstract qualities that can be further applied in various proportions to match any concrete object.

The products of mental imagery should look more like a palette than like finished masterpieces, and I suggest that, in their normal intrinsic state, they do. The normal unit of mental imagery remains blurred to some extent to be ready to fit any new set of associations. The template remains in a state of anticipation as a multitude of the entangled potentialities. All of these potentialities are simultaneously available for the immediate action of matching and recognition.

What makes the mental imagery template a hallucination is its undue auto-completion. The spontaneous stroke, brought about by the chemically induced super-activation of imagination, catenates some arbitrary set of dashes out of their whole manifold blueprinted in the brain, eventually producing a concrete, though contingent image. Out of the many possibilities, one set of options crystallizes into the finished picture. The collapse of the mental imagery template into a single image

is in some sense similar to the collapse of the wave function in the quantum physics.

Is some particular hallucinatory image predetermined to appear and not other? I suspect that the final shape of a hallucinatory image is unpredictable because at least four independent factors contribute to its formation.

First, the starting template that becomes the hallucination carries the traits of some previously observed real object, and so the hallucination inherits some traits of the reality.

Second, each hallucination is a chain reaction product of the random mutual rebound among other hallucinations. So the features traceable to any single real object soon dissipate or reconstellate within the new synthetic mixture.

Third, images are also molded by the structures of neuronal tissue and of neurooscillations that underlie and carry them. Like forked lightning, which has no other design than to follow the easiest pathway through the air, hallucinations are forged to some extent by plainly structural, typically - symmetrical underlying patterns. Visual geometric patterns have been described and classified in the literature on hallucinogens for quite some time (Klüver, 1942; Oster, 1965). More recently, Bressloff *et al.* (2001) presented a mathematical model of how the patterns may originate in the brain under the influence of hallucinogens. The model states that the patterns appear because of the crystalline-like structure that organizes the cells in the primary visual cortex.

Fourth, on the opposite side to plainly structural pattern forging, the intimate person-specific meaning can be attributed to pictures that are initially generated contingently and without purpose. The imparted meaning might modify and channel the further evolution of the picture.

The spontaneity of short-circuiting and the complexity of several independent factors that interweave mean creative novelty in bringing about each hallucinatory image. The image, which you see as highly realistic and as if drawn by conscious designer, is self-created; it didn't exist before

at all, it is a perfectly new piece of the brain art.

Earlier in this section, I suggested that hallucinations appear because neurophysiologic shield is withdrawn, so mental imagery templates become visible. Later in the section, I introduced a somewhat different explanation, namely, that it is the self-completion of a template that turns it into a visible hallucination. Which of the two explanations gains the upper hand? Can they be reconciled?

I suggest that both explanatory hypotheses should be understood in terms of their interdependency and complementarity. The clue might be that by the very act of withdrawing of the shield, the mental imagery templates are forced to auto-complete and collapse into hallucinations. Becoming hallucination-like, and thus concrete and visible, the template ceases to exist. As retaining its very nature of non-concretized set of potentialities, the template does not yield to viewing. Like in the paradox of the observer in the quantum physics who, by the very act of observation, reshapes what he intends to observe, you cannot see mental imagery templates otherwise as hallucinations. Opening the cover means not only seeing hallucinations but producing them by this very act of opening. The conclusion is that hallucinations should be understood as objects of a quantum nature.

VI. Alien creatures and visible language

I will now consider two particularly fascinating types of psychedelic visions, namely, those of realistic-looking humanoid creatures such as elves and visible language communicating prompts and commands. Let us discuss two reports of these types of experiences.

I did see glimpses of scary hobgoblin faces, grotesques (all in this whimsical geometric way) ... The beings would seem to go, 'look!' and I felt I was supposed to look. ... Since this experience, nearly three years ago, I've often thought back to what was going on with the 'elves' whispering 'Look.' They actually seemed to be communicating 'yes' and 'no' as well... They were teaching me about choice (yes/no) and attention (Look!) (Anonymous report, 2001).

The 'elves' appeared. ...They are 'made out' of the visible language. The message is conveyed by the medium itself in several simultaneous sensory modalities. Vision, heard speech, read language, music, song, images and pictures all happen at once, so that the meaning is multi-dimensional. ... The elves were 'telling' me (or I was understanding them to say) that I had seen them before, in early childhood. ... They looked just like they do now: ever shifting, folding, multidimensional, multicolored (what colors!), always laughing, weaving/waving, showing me things, showing me the visible language they are created/creatures of, teaching me to speak and read. (Are they the linguistic programs made manifest and personified?) (Gracie and Zarkov, 2000).

Gracie and Zarkov, the pseudonymous authors of the last excerpt, provide a good explanation of the elves and the visible language effects with their guess in the final bracketed phrase. The elves are nothing more than the ever-present, though normally veiled, virtual formations in the brain. These virtual formations are designed to mediate communication between parts of our inner self. These virtual, personified, communicating entities, as well as the multimedia mental language referred to in the quote, are tools that are permanently employed in our imagery workshop. They are like the Windows iconic shell, which does not replace the underlying DOS core programming language but rather mediates it to make it more easily exploitable. The mental elf is a nearly direct analogue of the virtual helper who pops up in Microsoft Word (I always switch the helper off; he bothers me).

B. Shanon (2010; p.277) quite soberly and rationally summarizes hundreds of experiences with ayahuasca, including his own as well as those of his informants: "the ayahuasca experience does not involve any paranormality. In particular, whatever is taught or learnt under the intoxication is n[either] due to receiving messages from beyond nor to accessing any paranormal ontology." Likewise, my conclusion is that the beings that are tangible in the psychedelic state are not the inhabitants of some separately existing world who seek

communication with us and are ready to guide us.

I have experimented in the psychedelic state to examine whether these entities can provide ultra-mundane knowledge, which would confirm that they do belong to an alien reality. I have asked them difficult questions about the purpose of the universe and the essence of life, but the answers were always teasing and evasive. I have concluded that talking to these entities was nothing more than talking to myself. I was stewing in my own mental juices and was unable to step beyond the bounds of the knowledge I already possessed.

Why do so-called elves appear in the majority of the reports, and not some other type of creature? I believe the answer is that a person's cognitive abilities are initially formed in early childhood. Elves and goblins are childish and playful figures. Akin to the function of dolls and animal toys in the material world, learning is mediated by amicable little toy people in a child's mental world. The visualized tools of the childhood learning processes become ingrained and, in most cases, are not replaced in adulthood.

VII. The existence of a separate reality, telepathy, and expanded control over the body: points of doubt

If one assumes that some real events are evidenced while viewing psychedelic hallucinations, then there may be two ways of understanding the ontological nature of the reality that is accessed. The first explanation of the phenomenon would be that, while hallucinating, one enters an alien world, watches the events that happen there, and communicates with its inhabitants. The second explanation would be that in the psychedelic state, one accesses a universal bank of perceptive data shared by all living beings. Thus, one can tune into someone else's past, present, or even future experiences. In the second explanative variant, what is accessed is not an ontologically detached reality, as in the first variant, but rather the same universal reality that we all experience, though perceived from the viewpoint of another creature or from some common viewpoint. In this second explanation, the universal super-consciousness is understood to unite all of

the seemingly detached elements of life into a single whole that mentally connects all creatures.

Concerning the validity of the second explanation in particular, I present the following critical argument. Let us suggest that psychedelics grant access to a field of information universal to all living beings. Accessing this field allows one to draw knowledge from the brain of another living being. This process might be facilitated by endogenous psychedelics such as DMT. If a collective mental data bank were accessible with the help of endogenous psychedelics, then evolution would have inevitably led animals to engage in massive and constant cognitive spying, so to speak. Why would we have large ears and sharp eyes if we could read the intentions of our enemies and prey via telepathic brain-to-brain connections? Nothing approaching this fantasy exists in reality. Animals appear to anticipate the desires of their competitors based only on their external behavior and not directly from their brains. This argument is indirect proof that a joint information field does not exist and that neither does the ability to intrude on the brains of others from a distance.

Aldous Huxley's famous concept of *'The Doors of Perception,'* which presumably opens under the influence of psychedelics to provide access to the *'Mind at Large,'* is subject to the same critical argument.

[E]ach one of us is potentially Mind at Large. But in so far as we are animals, our business is at all costs to survive. To make biological survival possible, Mind at Large has to be funneled through the reducing valve of the brain and nervous system. ... Through these permanent or temporary by-passes there flows ... something more than, and above all something different from, the carefully selected utilitarian material which our narrowed, individual minds regard as a complete, or at least sufficient, picture of reality (Huxley, 1990; p.23).

The point on which Huxley looks like to be mistaken is that this alleged access to the universal cognitive data bank would not be an unnecessary luxury and biological disadvantage, as he believes. If it were possible, this access would provide a great utilitarian advantage in an animal's struggle for survival. Because evolution did not utilize

this alternative direction, one should conclude that there was nothing there to be utilized.

Some experiments intended to determine the supposed existence of telepathic abilities under psychedelics were undertaken during the first phase of psychedelic studies in the 1960s. R.E.L. Masters and J. Houston, the authors of *The Varieties of Psychedelic Experience* (1966; p. 89), report on two controlled experiments conducted “in an effort to examine the validity of claims by subjects of ‘telepathic communication.’” The first series of experiments involved 27 subjects, whereas the second and better-designed series involved 62 participants. As the authors write, “possible changes in extrasensory awareness on the part of the subjects” have been tested. “Our efforts at demonstrating a drug-induced capacity for clairvoyance have yielded very little,” Masters and Houston conclude (Masters and Houston, 1966; p.89).

In another experiment, the subject would be asked to ‘get into the head of’ (or ‘identify with’) some historical or contemporary personage concerning whom the guide, it was believed, had much more knowledge and ‘inside information’ than did the subject. The subject was told to ‘incarnate’ himself in that person, to ‘be’ that person and think and behave accordingly. In some of these cases, the results were remarkable, the subject changing his voice, way of speaking, posture and even, it seemed, his appearance and way of thinking. The subject would not, however, lose his awareness of his own identity. He would, rather, ‘be two people,’ and would talk about his ‘new’ and ‘second self’ with plausibility that sometimes verged on the uncanny. Of such a ‘test,’ it must be said that it is never possible for the guide to be certain of the extent of the subject’s knowledge of the person with whom he ‘identifies.’ Asking the subject to ‘get into’ a person totally unknown to him is not productive. At the very least, however, this game has elicited some outstanding performances from persons not previously aware of any acting ability. Some of the performances also would necessitate the subject’s calling upon reservoirs of information, or memories, not consciously in his possession. Further, there seems to be demonstrated

here a heightened capacity for empathy (Masters and Houston, 1966; p.92).

I attempted to use some similar checks in evaluating my own experience. During the psilocybin trip I described at the beginning of this paper, I heard my mother (or a hallucinatory image of her) refer to me tenderly with a contrived word that could be translated into something like ‘birthling’ in her native language. When I first saw my mother after that vision, I asked her, ‘Did you call me ‘birthling’ when I was a baby?’ I hoped that if she had said ‘yes,’ this would indicate that I had direct access to concrete information that would otherwise have been unattainable. Her answer was only vague, however, as she stated, “Oh, I did, in this way and in others.” She did not confirm either that she contrived and used this very word, or that she had never made use of it.

Thus, my method of verifying the existence of telepathic abilities provided no results. There were three alternative explanations for the origin of hearing that word. First, I entered my mother’s spirit at that time; I literally became my young mother, and thus, this intimate word of her invention appeared in my mind. Second, when I was a baby, my memory stored the word, so I was then able to remember it. Third, I only imagined, though very realistically, how she might have cherished me. Because of the absence of unambiguous proof, I settled on the last explanation of the three.

If I were to experience the same scene in the psychedelic state again, I would try to memorize and then reproduce specific details, for example, the exact print of the fabric my mother was wearing. If she confirmed that she did have such clothing, this would be proof that the source of knowledge as provided by psychedelics was beyond that of mere imagination.

Many people believe that supernatural events happen to them when they are under the influence of psychedelics, or that psychedelics generate abnormal abilities in them. One such belief is that the mind may acquire powerful but dangerous control over the automatic physiological functions of the body, as described in this report.

My mind then shut out all pictures of reality, letting me melt them, turn things into cartoonish-type things, remove the skin, see the muscles, then see the skeleton. ... I was in total control of my mind and visuals and even audio. ... I worried that it would force my body, blood flow, to lose synchronization and kill me by stopping my heart. ... I suddenly felt as if I had gone where I should not have. I felt that my brain controlled everything about me, and that in this state I could hurt me by thinking about it (Anonymous report, 2000).

Some people report that, when in the psychedelic state, they have lost their ability to breathe automatically and had to transfer this function to 'manual' mode, drawing every breath via conscious effort. Others note that they monitored their organism on the level of molecular interaction or even on the atomic level. Some indicate that they became able to 'switch themselves off' to non-existence and then 'switch themselves back on' into existence.

Despite these reports, there are no known cases of death or severe bodily harm arising from the supposed ability to manipulate one's automatic physiologic functions in the psychedelic state. The panic of losing control over the body safely vanishes after the substance loses its effect.

There are several causes for the belief that one acquires abnormal abilities while on a psychedelic trip. All of these causes, however, produce only a verisimilar illusion of such abilities and not the real abilities themselves. The first cause for the belief in acquiring the abnormal abilities is that the blossoming imagination starts to override the authentic monitoring signals from the outside world and from inside the body.

The second cause is that the sensibility threshold does as a matter of physiological fact become lower under the influence of drugs. The variety of fine and ordinarily imperceptible signals from outside and inside are thus highlighted, such as those indicating blood flow or bone and muscle sounds.

The third cause is the distortions in subjectively perceived time. One of the effects of time distortion is that sequencing of events gets interrupted due to the short-term memory failure (Wittmann *et al.*, 2007;

Wackermann *et al.*, 2008). The next effect is that the objectively short intervals of time subjectively appear to last longer. In another article, I proposed an explanation of the effect of subjective time dilation. The explanation consists in that the perceptive frames in the brain become shorter and replace each other faster (Alyushin, 2010; p.443-448). The both mentioned effects in their combination make a tripper perceive that his single breaths and heartbeats do not exist in organic continuity but rather are detached mechanical events that require impulses from his consciousness to continue.

VIII. Concluding notes

Science demands repeatability, proof, and rationality, but can these be provided for a unique and very intimate subjective experience? The study of the psychedelic experience is almost completely limited to first-person reports. Can we treat these reports as a valid basis for scientific inference? I generally answer this question in the affirmative, though with some reservations. The study of subjective experience can be made as scientific as possible by finding recurrences and similarities across various reports. Subjective experiences that occur regularly among different people with known preceding inner states and similar cultural backgrounds and who have been given common, controlled doses might well provide objective and generalizable results.

Collecting samples of recurring psychedelic experiences and providing plausible explanations of their origins are not sufficient to make research fully scientific. The next necessary step is the experimental verification of tentative explanations. In addition to presenting explanatory hypotheses, a researcher should attempt to design experiments that allow him to verify or refute such hypotheses.

The abilities that the psychedelic state is sometimes believed to induce, such as those of penetrating the thoughts of others, perceiving distant events, and making bodies transparent for the purpose of diagnosis and cure, should be subjected to experimental verification. Trippers could be deliberately assigned to explore the worlds they enter in order to obtain the supposed

ultra-mundane knowledge or simply to prove the existence of those worlds. Indigenous healers and shamans might confirm their abilities before a commission of qualified physicians. If they do, so much the better! However, unless controlled experiments

confirm the existence of telepathic, visionary, and healing abilities under the influence of psychedelics, I consider it scientifically reasonable to presume the contrary.

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