Psychedelic Elephant

A Critique of Psychedelic Research

by Peter Webster

> First, sensory perceptions become especially brilliant and intense. Normally unnoticed aspects of the environment capture the attention; ordinary objects are seen as if for the first time and acquire new depths of significance. Esthetic responses are greatly heightened: colors seem more intense, textures richer, contours sharpened, music more emotionally profound, the spatial arrangements of objects more meaningful. People may feel keener awareness of their bodies or sense changes in the appearance and feeling of body parts. Depth perception is often heightened and perspective distorted; inanimate objects take on expressions, and synesthesia (hearing colors, seeing sounds, etc.) is common. Time may seem to slow down enormously as more and more passing events claim the attention, or it may stop entirely, giving place to an eternal present. ...
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> The emotional effects are even more profound than the perceptual ones. The drug taker becomes unusually sensitive to faces, gestures, and small changes in the environment. As everything in the field of consciousness assumes unusual importance, feelings become magnified; love, gratitude, joy, sympathy, lust, anger, pain, terror, despair, or loneliness may become overwhelming, or two seemingly incompatible feelings may be experienced at once. It is possible to feel either unusual openness and closeness to others or exaggerated distance that makes them seem like grotesque puppets or robots.[1]

My title, "Psychedelic Elephant", might lead some who are old enough to remember the incident [2] [3] to expect from this essay an indictment of the idiots who conducted the "scientific research" during which an elephant was clearly murdered.[4] It is always great fun to expose foolishness and willful ignorance, even decades after-the-fact. And, there is plenty to expose: Psychedelic research in those days, the 1950s and 1960s, attracted no small number of scientists who performed "research" that might be considered as somewhat less than illuminating.

> Jean Houston (1967) has described one of her initial observations of LSD administration. The subject was told by the psychiatrist that he would have “a terrible, terrible experience” filled with “strong anxiety and delusions.” The drug was administered in an antiseptic hospital room with several observers in white coats watching him. As the effects came on, the psychiatrist asked such questions as, “Is your anxiety increasing?” At the end of the experiment, the subject was in a state of panic. The psychiatrist announced to the group that LSD is indeed a “psychotomimetic” substance, which induces psychotic behaviour. [5]

1 From the Introduction to *Psychedelic Reflections,* Lester Grinspoon and James B. Bakalar, Human Sciences Press, New York, 1983.

2 LSD and the Elephant

3 Tusko: Elephants on Acid

4 A good lawyer might get his client off with a guilty plea to involuntary pachydermicide, arguing that scientists must often take risks to discover truth. With truths like these...

5 “The Effects of Psychedelic Experience on Language Functioning”, Stanley Krippner, in *Psychedelics*, Aaronson and Osmond, Doubleday & Company 1970.

...Not to mention the crew of highly-degreed nincompoops of MK-Ultra fame who - in the course of their "scientific research" - dosed an entire French village, with disastrous consequences.[6] [7] Since idiocy has already been so well covered elsewhere, rather than launch into what might be just another lengthy exposé on the subject sure to offend some of the descendants of those pioneering geniuses, I'd like to talk about another case in which scientific research and an elephant are featured. And here too, the science involved is not totally innocent of ignoring something important. Happily, it is a far more benign ignorance than that exhibited by those mentioned above. However, once my case has been made, I hope the reader will see that the ignore-ance, for the most part unintentional and excusable, absolutely permeates the entire enterprise called psychedelic research, from the 1950s through to the present. Quite a claim, to be sure.

Let me then introduce the elephant. He is an apparently mythical but oft-mentioned beast taken to standing unnoticed in the middle of rooms. The one I shall describe might be better thought of as standing in the middle of the laboratory, given that it is the typical psychedelic research scientist who does the not-noticing.

A compelling intro so far, but I can hear mutterings from the back of the lab insisting that, "OK, but this better be good!" I shall try to make it so, but as one might expect given my claim that just about nobody has noticed the elephant, it must be coated with some formidably efficacious invisible paint, a commodity so far known only in Tex Avery productions. In other words, it might take some even more efficacious cleansing of one's doors of scientific perception before the beast begins to show himself, even if my efforts at paint-removal are deemed logically irreproachable.

What practically no-one has explicitly noticed is that once one has *voluntarily* ingested a psychedelic chemical, there follows the *involuntary* adherence of that substance to some brain neuro-receptors, and that between this second event and the *voluntary* "psychedelic effects" that are then studied by the team, there is an important yet overlooked neurological/psychological/cognitive middle ground, some facilitating brain/mind event or process *between* the involuntary action of the drug at its target and the final outcome that the "subject" *does.* More mutterings from the back of the lab: "oh c'mon, we give 'em the drug and then the effect happens, and if we block the receptors the effect *doesn't* happen. What could be more simple than that?"

First, let me insist that the final "psychedelic effects" are always *voluntary,* in the sense that it is something the subject *does,* not something that merely *happens to him.*[8] The lodging of the drug at his neuro-receptors *is* something that *happens to him,* but then, according to configurable circumstances, the situation and intentions of the "subject", the research agenda, the personalities of all involved, the "set and setting"... the subject intentionally and with foresight and with conscious reference to those configurable parameters embarks on the road to the effects - either directly sought or discovered along the route. If the effects were not voluntary, then they would surely be easily reproducible and predictable, and with little variation as are the effects of taking an antibiotic for an infection, an example of an *involuntary* drug effect.

What I intend to add to this chain of events is an *intermediate step* achieved by a neurocognitive brain network, that logically and operationally connects the first involuntary step and the final psychedelic experience. This intermediate step will be seen

6 See H.P. Abarelli, Jr., *A Terrible Mistake – The Murder of Frank Olsen and the CIA's Secret Cold War Experiments*, 2009: Trine Day LLC. Walterville Oregon.

7 *Poisoner in Chief: Sidney Gottlieb and the CIA Search for Mind Control*, Stephen Kinzer, Henry Holt & Company Inc. (10 septembre 2019)

8 I anticipate some significant initial disagreement with this claim, but allow me to justify what should eventually seem quite obvious.

to be the principal, and perhaps *only important effect that is logically and pharmaceutically caused by the psychedelic drug.* And, it will be seen to be the very type of operation that could lead to such a wealth of "Varieties of Psychedelic Experience" - see the next paragraph here.

We have, then, for the purported "psychedelic effects" the following list, as well as those mentioned in the opening quotation of this essay:

> LSD and peyote are potent psycho-chemicals that alter and expand the human consciousness. Even the briefest summation of the psychological effects of these drugs would have to include the following: Changes in visual, auditory, tactile, olfactory, gustatory, and kinesthetic perception; changes in experiencing time and space; changes in the rate and content of thought; body image changes; hallucinations; vivid images—eidetic images—seen with the eyes closed; greatly heightened awareness of colour; abrupt and frequent mood and affect changes; heightened suggestibility; enhanced recall or memory; depersonalization and ego dissolution; dual, multiple, and fragmentized consciousness; seeming awareness of internal organs and processes of the body; upsurge of unconscious materials; enhanced awareness of linguistic nuances; increased sensitivity to nonverbal cues; sense of capacity to communicate much better by nonverbal means, sometimes including the telepathic; feelings of empathy; regression and “primitivization”; apparently heightened capacity for concentration; magnification of character traits and psychodynamic processes; an apparent nakedness of psychodynamic processes that makes evident the interaction of ideation, emotion, and perception with one another and with inferred unconscious processes; concern with philosophical, cosmological, and religious questions; and, in general, apprehension of a world that has slipped the chains of normal categorical ordering, leading to an intensified interest in self and world and also to a range of responses moving from extremes of anxiety to extremes of pleasure. These are not the only effects of the psychedelic drugs...[9]

When I first read this I was immensely relieved to hear there were *even more* effects than those listed! So are we to conclude that certain neuro-receptors, perhaps the 5HT2a ones that when blocked *prevent all of those effects,* are like some sort of switch that when once thrown, is the logical and direct *cause of those effects?*

> Yet even a moment’s reflection tells you that attributing the content of the psychedelic experience to “drugs” explains virtually nothing about it.[10]

The problem is this: It is now thought that a psychedelic drug, acting at *several* receptor types and sub-types (not just the 5HT2 as previously thought), either causes or "correlates" with psychedelic experience. But how are we to *map* such a great number of receptor operations upward through brain system activities, onto the multitude of psychedelic states of consciousness? Does the combination of activations of receptors a, b, c, d,... reliably *cause* in all subjects with set and setting x, y, z,... the psychedelic state of consciousness "enhanced awareness of linguistic nuances"?, and so forth. Clearly there is a problem with this approach, not just in practice but *in principle.* In effect, attributing *causation* in this direction - or even *correlation* - is a conceptual error and not merely a practical difficulty. We cannot dismiss the problem by merely claiming that there has not been enough research to accomplish the task. Ignoring an explicit or implied arrow of causation by claiming that the neurological condition is somehow *identical* with the

9 *The Varieties of Psychedelic Experience*, Masters and Houston, Holt, Rinehart and Winston 1966, p5.
10 Michael Pollan, in *How to Change Your Mind*, Penguin Press, 2018

psychological state, or that the neurological and psychological are just two *aspects* of the same thing - a position taken by some contemporary neuro-philosophers - won't do either.[11] The mapping problem remains as problematic as before.

We are then logically forced to ask: What is the *actual effect* of a psychedelic drug beyond the obvious initial effect of the substance lodging at some brain receptors? Some early research tried to pin the blame on "set and setting" as the elephant standing between the psychedelic drug lodging on brain receptors and what subsequently happened with the "subject" or "patient". But that too explains little: set and setting likewise determine my experience of my "ordinary day", so of course set and setting is also going to be an influence on a day when I take LSD, for instance. And, too, there is no such thing as a day without set and setting, a "blank slate" day where we could study the "real" effects of a normal day, or a psychedelic day. Are we to assume that set and setting are far more a determinate of a psychedelic day than a normal one? One might at first insist, "of course!" but some reflection should reduce one's enthusiasm for that initial reaction. This is not to deny the power of suggestion for a subject whose situation might be particularly receptive or vulnerable no matter what the cause of that vulnerability, such as the subject described by Jean Houston, above. What is at issue is whether the set and setting hypothesis "explains" something that is beyond the totally obvious, and I think that from this perspective, set and setting considerations don't really explain much at all.

So what is the nature of this elephant, this intermediate process that ties together a merely physical event with events of consciousness? A more "scientific" analogical entity might be useful here: the concept of a "black box". It has several inputs, and several outputs, but what happens inside we know not.

The inputs are multiple, and the one we are immediately concerned with here is the lodging of a psychedelic chemical on some of the brain's neuro-receptors. A very simple, sublunary and repeatable event that has really nothing about it that would differentiate one dose or one psychedelic experience from another. But other inputs will do fine as well, at least sometimes: meditation, sensory deprivation, religious techniques, breathing exercises, CO2 inhalation, extreme sport...[12] The list of things is long that have been reported to bring about the outputs of the black box such as items in Masters & Houston's long list above. Outputs such as religious ecstasy or cosmic consciousness or whatever you want to call it can even happen spontaneously, with apparently no input to the black box!

Now the question of course becomes, what the deuce is inside that black box? How can so many apparently diverse inputs produce an even greater abundance of outputs and who or what is doing the choosing inside the box? It might seem that the hidden circuits inside the box must be enormously complex, but I believe it is a *single, readily-defined* operation, perhaps some cognitive process or event, that when spurred by a drug or meditation, or other input, can reliably and without prejudice as to the spurring agent, then be the first event in a causal chain leading a person to undergo a psychedelic experience that may feature any of the characteristics formerly thought of as drug effects. The reader may have to reflect on this for awhile, to finally see that there surely is a "something" in the black box that is the same something that is spurred, invigorated, amplified by any of a number of diverse inputs, and it is the same something that in all cases then permits/incites/encourages the person to "do" a psychedelic experience. Otherwise, cause and effect have no meaning when we look at the overall picture. (A "cause" that does *this,* or maybe *that,* or none of the above sometimes, but not always, or maybe is not even necessary...) Lest someone accuse me here of flogging a dead horse, for "we all know that it remains difficult to understand psychedelic experience," it is far more than mere difficulty!

11 For a full examination of these problems see Tallis, *Aping Mankind,* pp. 85-7

12 See also Ludwig AM (1966) “Altered states of consciousness” *Arch Gen Psychiatry* 15:225–234, also in *Altered States of Consciousness*, Charles T. Tart, Doubleday & Company 1972 pp15-19.

What is at issue here is the grand probability that the foundational paradigm that serves to guide psychedelic research, and indeed neurocognitive research as a whole, is obsolete and bound to produce the conflict and contradictory results that signal impending paradigm shift and scientific revolution.[13]

Let us call what goes on inside the black box "Operation X". Here's what we know and can deduce about Operation X:

1. It can operate at a great range of intensity or levels of efficiency, perhaps analogous to the range of fear a human can experience, from a mild cautiousness to a hair-raising attempt to flee the scene. This may be an apt analogy also since the range of intensities of a single thing, fear, can lead to a wide variety of completely different behaviours, not just a single behaviour carried out at different levels of exertion.

2. Its intensity of operation is determined by the size of drug dose, or the diligence of the meditator, the level of extreme sport exertion, the length and or harshness of the "religious technique", and so on. In other words, the characteristics of the input determine whether Operation X is merely a mild change, or perhaps a radical and overwhelming influence on what the person then *does* (*not what happens to him!)* during his experience.

3. It is the same operation in all cases, whether weak or strong, incited by a drug or other input, or even no apparent input at all.

4. Operation X is something that is positive, i.e., not a lack or diminution of some other type of neuro-cognitive activity, not the cessation or pollution of some normal process nor the confusing or "entropic" disruption of normal brain operation, nor is it an overload or breakdown of some brain circuits or cognitive system.[14]

5. It is also a *normal* function and always present to some degree as a precursor and contributor to our conscious awareness, our *do-ings*, although it might be radically diminished or essentially eliminated in certain persons in some circumstances.

6. When psychedelic drugs are used as "curative agents", it must therefore be the case that the activation of Operation X, perhaps to an extreme level, is what leads to the curative result, i.e., the patient is therefore "curing himself" since the drug *only affects* Operation X and what results from Operation X is *voluntary.*

7. There must be a brain system or network that achieves Operation X, and it must be neurologically influenced by any of the various possible inputs.

Specific Cases

Looking at examples of recent psychedelic research shows both how little noticed is the elephant, yet in a few cases gives some important hints as to his whereabouts and nature. Let's take a peek at a few recent studies. I shall not mention authors of these papers, just a title and a brief quote and/or comment, since I intend no undue criticism. All modern psychedelic research is precious, considering the long repression and the unforgivable stain that some early research condemned us all with.

> *Psychopharmacology* · August 2015
>
> "LSD enhances the emotional response to music"
> "*Objectives:* The present study sought to test the hypothesis that music-evoked emotions are enhanced under LSD."

13 See "Thomas Kuhn and the Psychedelic Revolution" at http://www.psychedelic-library.org/

14 I am perfectly aware that some researchers have extensive libraries of fMRI scans that they claim show such effects as "overload", "breakdown", etc., and I will comment on that below.

OK, but exactly *how* does this happen? How would LSD "enhance" something as complex and personality-specific as the perception and response to a musical composition, and why wouldn't it merely turn it on or off if it is either lodging on receptors or being blocked - an apparently all-or-nothing process? Are we simply to add "enhanced emotional response to music" to Masters & Houston's Master List of Effects, *or is the elephant invisible to these researchers?*

> *Psychopharmacology* · August 2017
>
> "Psychedelics and connectedness"

The paper concerns the therapeutic treatment of depression and other "psychiatric disorders" with psychedelics, and actually asks, "*how* are psychedelics effective? We propose that a sense of connectedness is key". "Connectedness" seems a rather abstract "effect" to posit as an answer to the *how* query, essentially semantic although one can qualitatively understand how a patient might experience "a renewed sense of connection or connectedness... to (1) self, (2) others and (3) the world in general" after suffering from a depressive state featuring a sense of isolation, loneliness, seeing little value in living, etc. As such, "connectedness" seems merely an arbitrary linguistic way to describe the changed outlook the patient experiences, it could hardly be called a direct effect. Once again, either add it to Masters & Houston's list or see the elephant. The authors continue:

> One of the most curious aspects of the growing literature on the therapeutic potential of psychedelics is the seeming general nature of their therapeutic applicability, i.e. they have shown promise not just for the treatment of depression but for addictions, anxiety and obsessive-compulsive disorder. This raises the question of whether psychedelic therapy targets a core factor underlying mental health. We believe that it does, and that connectedness is the key.

The observed "wide applicability" of psychedelic therapy is a dead giveaway and shows it can *only* be understood by seeing that what is really being accomplished is "Operation X therapy". The psychedelic drug always does the same thing to the receptors, but Operation X may assist and encourage the patient or subject to do all sorts of things.

> *Journal of Psychopharmacology* 2019
>
> "Cessation and reduction in alcohol consumption and misuse after psychedelic use"
> Meta-analysis of randomized studies using lysergic acid diethylamide (LSD) for alcohol use disorder (AUD) showed large, significant effects for LSD efficacy compared to control conditions.

It has long been documented[15] that psychedelic experience can and often does result in a person giving up his alcohol or drug problem. In this case, my claim that psychedelic effects are voluntary is not just conjecture that might be debated by some, but perfectly obvious: resolving one's addiction problem cannot be other than a *voluntary process.* (See item #6 in the list of Operation X properties, above). The psychedelic drug used is in no sense like the anti-alcoholism drug *antabuse,* for instance, that when once taken then acts involuntarily. Once again we can only understand the overall process by including

15 Beginning with Hoffer and Osmond in the 1950s, see *The Hallucinogens*, Hoffer and Osmond, Academic Press 1967

Operation X and how its activation can so radically influence the person to take voluntary measures he otherwise appears incapable of taking.

> *European Neuropsychopharmacology* - January 2019
>
> "LSD increases social adaptation to opinions similar to one's own"

This actually is quite an interesting study, but here too it must be immediately obvious that saying that "LSD increases..." cannot possibly be literally true, so as before we must add the "effect" to the Master List or include the intermediate Operation X step I propose. Once again, the invisible paint has functioned perfectly.

> ResearchGate Preprint · January 2019
>
> "LSD impairs working memory, executive functions, and cognitive flexibility, but not risk-based decision making"
> Abbreviated Running Title: "LSD impairs cognition via 5-HT2A receptor activation"

We are surely asking a great deal of LSD if it is to "cause" all these "effects". The evidence supposedly supporting the conclusion stated in the titles was collected using various psychological tests. The research also specifies, as do many other recent studies, that "Pretreatment with the 5-HT2A antagonist ketanserin normalized all LSD-induced [effects]." This of course does not prove the conclusion that "LSD impairs" but only that blocking the receptors prevents the change in Operation X that LSD would otherwise cause. As for whether LSD -> Operation X -> stated results is the actual causal chain the psychological tests are supposed to prove: What if Operation X has simultaneously involved the subject in extensive attention-attracting activities unrelated to what the researchers are researching, so that the stated results such as "impaired cognition" are merely a *by-product* of what the subject is *doing*? It is not clear whether the authors have the least suspicion of this possibility, but response to 100µg of LSD is widely recognized to lead to all sorts of complex *doings* by a "subject" that might be interfering with a testing regimen - he may be listening to a bird singing a miraculous tune outside the window and in spite of his best intentions not give a hoot about applying himself to the testing procedure. It is also probably impossible to "control for" such spurious happenings if direct cause and effect is posited. Bringing Operation X into the picture may help greatly, however.

> *International Review of Psychiatry* - September 2018
>
> "Awe: a putative mechanism underlying the effects of classic psychedelic-assisted psychotherapy"

Now here we almost have to do a double-take. Could "Awe" be the elephant, the Operation X we need to clarify so much psychedelic research? Unfortunately I think that although close, perhaps, the hypothesis is somewhat less than awesome. And again, "awe" is something more semantic than neurological, something we can only add to Masters & Houston's list. However, I recently came across another study that almost hit the nail on the head:

Frontiers in Neuroscience March 2018

"The Meaning-Enhancing Properties of Psychedelics and Their Mediator Role in Psychedelic Therapy, Spirituality, and Creativity"

Enough suspense then, I am now going to reveal to you and without further ado, exactly what Operation X is. In fact, we have known for a long time what Operation X is. Aldous Huxley provided some important insight about it in 1954, Alan Watts stated almost precisely what it is in 1958, an article in *50 Years of LSD* suggested it.[16] No-one, however, followed through on the idea until I wrote a few notes about it in the late 1990's and then in 2001 received a very encouraging comment from Jaak Panksepp, author of the magnificent *Affective Neuroscience.*[17] But no-one, including myself, could take the idea any further until just recently, thanks to some quite amazing neurocognitive research.

Huxley writes,

> I took my pill at eleven. An hour and half later I was sitting in my study, looking intently at a small glass vase. The vase contained only three flowers—a full-blown Belle of Portugal rose, shell pink with a hint at every petal's base of a hotter, flamier hue; a large magenta and cream-coloured carnation; and, pale purple at the end of its broken stalk, the bold heraldic blossom of an iris. Fortuitous and provisional, the little nosegay broke all the rules of traditional good taste. At breakfast that morning I had been struck by the lively dissonance of its colours. But that was no longer the point. I was not looking now at an unusual flower arrangement. I was seeing what Adam had seen on the morning of his creation - the miracle, moment by moment, of naked existence... [I was seeing] a bunch of flowers shining with their own inner light and all but quivering under the pressure of the significance with which they were charged... [And] the books, for example, with which my study walls were lined. Like the flowers, they glowed, when I looked at them, with brighter colours, a profounder significance. Red books, like rubies; emerald books; books bound in white jade; books of agate, of aquamarine, of yellow topaz; lapis Lazuli books whose colour was so intense, so intrinsically meaningful, that they seemed to be on the point of leaving the shelves to thrust themselves more insistently on my attention... At ordinary times the eye concerns itself with such problems as Where?—How far?—How situated in relation to what? In the mescalin experience the implied questions to which the eye responds are of another order. Place and distance cease to be of much interest. The mind does its perceiving in terms of intensity of existence, profundity of significance...[18]

Alan Watts' contribution to the quest:

> I have said that my general impression of the first experiment was that the "mechanism" by which we screen our sense-data and select only some of them as significant had been partially suspended. Consequently, I felt that the particular feeling which we associate with "the meaningful" was projected indiscriminately upon

16 "LSD and phenethylamine hallucinogens: common sites of neuronal action", G.K. Aghajanian, in *50 Years of LSD: Current Status and Perspectives of Hallucinogens,* Pletscher and Ladewig, editors, Parthenon Publishing, 1994., chapter 3.

17 Jaak Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions*, Oxford University Press September 2004

18 Aldous Huxley, *The Doors of Perception*, 1954, Chatto & Windus. Quotation assembled from various sections of the essay.

everything, and then rationalized in ways that might strike an independent observer as ridiculous—unless, perhaps, the subject were unusually clever at rationalizing. However, the philosopher cannot pass up the point that our selection of some sense-data as significant and others as insignificant is always with relation to particular purposes—survival, the quest for certain pleasures, finding one's way to some destination, or whatever it may be.[19]

In 2001, having mostly completed my first attempt at a theory about how psychedelics might work, I wrote to Jaak Panksepp:

> I've noticed in your book, [*Affective Neuroscience: The Foundations of Human and Animal Emotions]* and in a few other sources, a mention of the fact that the *locus coeruleus* is seen to be very active when an animal is experiencing significant or salient features in its environment, whether they be threatening or pleasing, positive or negative. But in the sources I've seen that mention this, it seems that it is taken for granted that the *locus coeruleus* is "reacting" to the salience observed.
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> In my investigations of what might be the initial "causes" of the altered states of consciousness produced by [psychedelics] I have been snooping around the neuro-cognitive literature, and come up with an idea that instead of reacting to salience, perhaps the *locus coeruleus* is the controlling centre for a brain-wide functional [network] whose major task is the *detection* of salience, not only for the sensory input in animals in general, but enlarged in function in humans to provide detection of salience even in ongoing heuristic thought. That this module would involve such an ancient brain part might be understandable if we grant that rapid "automatic" detection of salience in the environment would be of such advantage that evolutionary pressures would have brought it into existence very early, in very primitive brains.
>
> I won't trouble you with further explanations of my idea here, nor mention any of the evidence I've discovered that might support it, but simply would like to know your "down-and-dirty" opinion of this hypothesis, and perhaps suggest some leads that might shoot it down or, hopefully, indicate its possibility. In reference to the effects of [psychedelics], of course, it seems that the serotonin system is first altered by these substances, but I believe that the *raphe nuclei* have a controlling function over the *locus coeruleus*, perhaps acting to control the "gain" of whatever functions the *locus coeruleus* accomplishes. My overall hypothesis must thus be clear to you!

In those days one could still locate the email address of even famous scientists on the internet, write to them, and have some hope of a thoughtful reply. Thus:

> Hi Peter,
> I am just off for a few weeks in Europe in a few hrs, so let me give you a quick reply. Your hypothesis is very much in the right direction. . . indeed, I suspect it is implicitly in the minds of most neuroscientists. It has been long known that the LC sets up attentional processes in the cortex, and there are many sensory and emotional inputs that could achieve this. Lots of neuropeptides feed into the LC, so it is really not necessary to make it the first and only link in the salience cascade, but certainly a prominent one. In short, I see no problem with this hypothesis, and in a sense it is implicit in the neurophysiological finding that LC-NE increases signal to noise levels throughout sensory cortices.

19 "The New Alchemy" in *This Is It,* Alan Watts, Random House, 1958.

So there we have it:

Operation X = Salience Detection

The last mentioned study above, "The Meaning-Enhancing Properties of Psychedelics..." should more accurately be titled "The Salience-Amplifying Properties of Psychedelics..." although the author does use the term "meaning" in a closely similar way, and even refers to the same passages in Huxley's *The Doors of Perception* as I do. But "meaning" also implies a definition, as in "his meaning was not clear to me, or, I don't know the meaning of that word..." Salience is the preferred term.

Snickers from the peanut gallery? "Ridiculous! It's gotta' be more complicated than that!"[20] Please be careful not to get stomped by the elephant as you make your disappointed exit. But if you'd care to stay awhile...

Remember that my hypothesis as stated to Jaak Panksepp is that said salience detection is accomplished "not only for the sensory input in animals in general, but enlarged in function in humans to provide detection of salience even in ongoing heuristic thought." And item #1 above claims that the system has an enormous range of intensity of operation. We could expect a positive feedback reinforcement of SD as one first seizes on a significant perception or thought, then realizes that this process *itself* is unusually salient, and so on, until as Alan Watts says, "the particular feeling which we associate with 'the meaningful' was projected indiscriminately upon everything." And yet as we guide our psychedelic experience - remember that it is *voluntary* - we still can discriminate and choose where to go next amongst the expanded range of highly salient perceptions and thoughts suddenly vying for attention. The situation might even be thought of as a multiple "Eureka Moment".[21] The mechanism whereby *creativity* can be stimulated? The reason why psychedelic experience "treats depression" when the patient is in a state where *nothing* seems salient enough to pay attention to, even life itself? A possible explanation of *microdosing,* where SD is just very slightly amplified, not going all the way to the radical positive feedback mode...?

As for the other studies listed above, it is not difficult to show how SD and its amplification is the key, the intermediate process between the drug and the experience. Enhancing the emotional response to music? Obvious. I leave it as an exercise for the reader. Awe? Ditto. LSD increases social adaptation to opinions similar to one's own? A bit more complicated. You would need to study the paper in detail with the SD/SA hypothesis in mind. My opinion is that it works fine.

But what about all those studies that show breakdowns, deficits, overload, often backed up by extensive brain-scan images? Or, as stated by a currently popular and prolific psychedelic researcher, "Psychedelics alter consciousness by disorganizing brain activity." I

20 Yes, I would certainly agree that any theory about human cognition, about consciousness, about how the relationship between mind and matter might be scientifically described, must indeed involve some complications that would need continuing research to clear up. Such a clearing up may in fact turn out to be a far more difficult project than we can even know, from our present perspective. What I have tried to do with this essay, perhaps with some over-simplification, is to clear away some misperceptions about how psychedelics might work, views about psychedelic effects accumulated during what hopefully has been just the first phase of psychedelic research, a phase where we have been much like children experiencing something new and amazing but not having the required background knowledge and analytical skills to understand more deeply. It is my hope that I may have provided a fresh starting point for a more advanced attempt at understanding.

21 The eureka effect (also known as the Aha! moment or eureka moment)

would not be the first to caution that brain scans may or may not actually indicate what they are purported to indicate:

> It is surprising that the world has not wearied of stories of findings by neuroscientists that are supposed to cast light on our true nature. Popular articles - which are often heavily dependent on press releases provided by the public relations departments of grant-hungry laboratories - are usually accompanied, as we have noted, by a brain scan. These are seen as visible proof that those clever boffins have discovered the neural basis of love (maternal, romantic, unconditional), altruism, a propensity to incur toxic debts and so on. And that's just for starters...
>
> According to the neuroscientist Mario Beauregard, the truest form of love - truer than the interested love of those who hope to gain from their object, truer than maternal love, or truer even than romantic love - is the love that low-paid care assistants looking after people with learning disability feel for their charges. In a study entitled "The Neural Basis of Unconditional Love", care assistants were invited to look at pictures of people with intellectual disabilities first neutrally and then with a feeling of unconditional love. By subtracting the brain activity seen in the first situation from that seen in the second, the authors pinned down the neural network housing unconditional love.[22]

In response to another paper that entertains the "overload/breakdown" theory, backed up by brain scan evidence from the authors and a number of other studies cited in the 68 references listed: "Effective connectivity changes in LSD-induced altered states of consciousness in humans", (Preller et al., *Proceedings of the National Academy of Sciences*, January 2019), I wrote to the authors:

> I first read of Franz Vollenweider's hyperfrontality idea quite a number of years ago: "marked activation of the prefrontal cortex (hyperfrontality)" and "these findings suggest that disruption of cortico-subcortical processing leading to sensory overload of the cortex is a communality of these psychoses." ("Brain mechanisms of hallucinogens and entactogens").[23] I was quite dissatisfied with the theory then, and am even more dissatisfied now that "hyperfrontality" has been the suggested result of a psychedelic-caused deficiency or decrease of so-called thalamic filtering, leading to a postulated "sensory overload".
>
> Firstly, hyperfrontality theory on its own implies an overload, a saturation or over-saturation of capacity, a brain area driven to breakdown in attempting to "process" too much "data" - and if this were true we might expect psychedelic experience to be a general confusion and inability to think clearly. While novice or badly prepared users who might have much personal material to work through can sometimes experience overwhelming emotions, memories, etc., in general the psychedelic experience has over many millennia been an experience not of confusion, but of awakening, of clarity. Think of the night of awakening at Eleusis in ancient Greece.[24] Or of Huxley's and Watts' reports of their psychedelic experiences. (*The Doors of Perception, The Joyous Cosmology*). Surely these are not brains in overload, leading to confused minds unable to understand what their experiences are about. (You allude to this conflict of view when you write near the end of your paper: "This might explain the seemingly paradoxical subjective effects..."). I don't think there's a paradox here but rather a flawed paradigm for understanding psychedelic experience.
>
> When compounded by the idea that psychedelics produce decreased or deficient thalamus filtration and that is the cause of hyperfrontality and sensory overload the theory gets even more questionable, not representing the wide range of philosophical

22 Raymond Tallis, *Aping Mankind,* Routledge, 2016, "Chapter 3, Neuromania: A Castle Built on Sand"
23 "Brain mechanisms of hallucinogens and entactogens" in *Dialogues Clin Neurosci*. 2001 Dec
24 Webster, Ruck & Perrine, "Mixing the Kykeon"

and psychological facts concerning altered states of consciousness of all sorts. As for the necessity for "thalamic filtering", if, as is currently suggested by the theory, we are told that we receive far more sensory input than we can process and therefore the thalamus is needed as a filter to weed out excess, irrelevant, or ambiguous signals, on what basis is the filtering done? What are the criteria for "deciding" what signal is irrelevant? And who or what is doing the "deciding"? Clearly we would need to "process" the data that needed filtering or how would we (the thalamus?) "know" that certain particular data required filtering? There is even more illogic to the filtering idea that occurs to me, but enough for now.

Nevertheless I would agree that we do not, in general, experience the greater amount of sensory "data" that is being received, in fact I think we - in normal routine consciousness - experience almost *no* "raw data" from the senses but rather a representation of that data based on previous experience. We experience mostly what we have previously experienced. No "filtering" necessary. I explain this more fully in my book, *KOSMOS*.[25] Psychedelics help us to suspend this dependence on previous experience so that we may approach experiencing the unique qualities of our surroundings and state of mind "in real time", and pursue original and creative thinking pathways about those surroundings. Meditation and other age-old techniques achieve the same result, if with somewhat more effort and diligence.

If the frontal areas are seen in scans to be operating at high intensity, then we must not conclude that the subject is suffering from an "overload" or a "hyperactivation" of his frontals *caused by* deficient sensory filtering, but rather that he *is using these areas of the brain as an implement to his stream of consciousness and thinking; he is using these brain areas to accomplish his experience,* and the impetus encouraging the subject on those conscious paths derives from an entirely different and more fundamental initial effect. This "different and more fundamental initial effect" must in addition be what can be activated by certain age-old techniques such as meditation if we wish to understand the similarities between "self-induced" and spontaneous ASCs (such as described by Albert Hofmann in "My Problem Child"), and the psychedelic experience.

As for experimental scan results, keep in mind that if subjects are told, or believe they are experiencing sensory overload, or have read about hyperfrontality theory, that suggestion or belief then becomes part of the "set and setting" so they will most likely convince themselves a psychedelic experience is just that: one of "too much too fast". Much of early psychedelic research suffered from providing the wrong set and setting, so it would be disappointing to see the same error being made today.

We need to ask whether it is LSD that brings about certain "effective connectivity alterations" or rather is it that the subject may be causing these alterations as he reacts to some more fundamental changes, and works through his LSD experience. So, does LSD "diminish the influence of the striatum on the thalamus and open the thalamic filter" or is it the subject, in the process of "doing" his psychedelic experience, that is the actual cause? You note that the thalamic filter is opened - but selectively. The "selectively" finding is a great improvement over previous ideas, but indicates to me that it is in fact the subject's conscious processes that are behind the changes in effective connectivity - the causation is from top down, consciousness to neurology, rather than bottom-up. We are not the slaves of our neurons, and must be acutely aware of and beware falling into mereological fallacy, where attributes of the whole are assigned to a part: where we say that the "brain does so-and-so" whereas in actual fact only the organism as a whole can be said to "do" it.[26] Quite literally, t*he brain is used by the organism to achieve a result*.

What I am claiming here, no doubt much to the disdain of many contemporary experts, is that attempting to discover the precise and unique “neural correlates” of some state of mind or perceptual process, not to mention consciousness itself

25 *Kosmos: A Theory of Psychedelic experience* by Peter Webster

26 See Bennett & Hacker, *Philosophical Foundations of Neuroscience,* Wiley-Blackwell; Read *Excerpt*

(including psychedelic experience!), is little more than a fool's errand. As a complex conscious organism, *I use* my brain to accomplish certain tasks and goals, in an entirely analogous way as I use my arm for a tennis shot. There are no exact, unique, reproducible "muscular correlates" of a tennis shot, and even if one could experimentally arrange that a test subject could encounter exactly the same impending tennis shot several times in a row, the subject would no doubt accomplish that shot with a great many possible combinations of muscular operations yet achieve the task in a way indistinguishable from any other. Even at a simplistic level, if the subject did two shots in close sequence, some of his arm muscle cells would be recuperating and resting from the first shot, so of necessity the "muscular correlates" for the second shot would be far from identical to the first. How could it be any different using my brain to think up such an argument as presented in this paragraph? Or are there unique and exact "neural correlates" for concocting an argument that demolishes that possibility?

We first need a viable philosophical and psychological model of psychedelic experience before we can even begin to sort out what all the vast amounts of neurological data might mean, and how that data might fall into place around the philosophical and psychological model. My congratulations to your team, and others as well, for revealing such great collections of microbiological findings about the brain under a great many situations. But it is my hope that a new, or at least expanded paradigm will be better able to organize those findings in a way more accommodating of ancient and modern knowledge of a different sort.

The views of Raymond Tallis and Bennett and Hacker (references 18 and 22 of this paper) on these matters are certainly controversial but only in the sense that current research paradigms - in practically all of cognitive neuroscience - are ignoring their important advice. According to Thomas Kuhn, the ignoring of accumulating views and data that just doesn't fit in with ongoing "normal science" is a sure sign of an impending paradigm shift and scientific revolution. The only options for old-paradigm advocates are either to see the elephant-in-the-room - the impending changes to come - or just ignore the whole thing with total silence on these matters. So far, it is the second solution that I see widely employed, thus the present paper.

The Salience Network

It remains to mention the recent extraordinary research that supports my conclusions.

The SN [Salience Network] is an intrinsically connected large-scale network anchored in the anterior insula (AI) and dorsal anterior cingulate cortex (dACC). The SN also includes three key subcortical structures: the amygdala, the ventral striatum, and the substantia nigra/ventral tegmental area...The nervous system dynamically selects specific stimuli for additional processing from a constant stream of incoming sensory inputs. Saliency detection mechanisms in the brain are at the core of this process and can be conceptualized into two general mechanisms. The first is a fast, automatic, bottom-up 'primitive' mechanism for filtering stimuli based on their perceptual features... At each level, salience filters enhance responses to stimuli that are infrequent in space or time or are of learned or instinctive biological importance... The second is a higher-order system for competitive, context-specific, stimulus selection and for focusing the 'spotlight of attention' and enhancing access to resources needed for goal-directed behaviour. The large-scale network described here is a core brain system that implements this latter process... Within the context of the SN, events that are likely to be perceived as salient include deviants embedded in a constant stream, surprising

> stimuli, and stimuli that are pleasurable and rewarding, self-relevant, or emotionally engaging.[27]

Several recent papers implicate both the *raphe nuclei* serotonin neurons and the norepinephrine neurons originating in the *locus coeruleus* in the operations of the Salience Network.[28] The field of research is comparitively very new and the situation studied exceedingly complex, and I will not pretend to have more than a few suggestions about the actual mechanisms of salience amplification through to psychedelic experience activation. Obviously, we need research into how the SN is controlled, how it maintains its ordinary everyday operation where most events and thoughts are overwhelmingly deemed hum-drum, of little consequence, and how the gain of the SN might be radically increased so that one's very existence may be perceived for the miracle that it in reality is. So that,

> ...I was not looking now at an unusual flower arrangement. I was seeing what Adam had seen on the morning of his creation - the miracle, moment by moment, of naked existence... [I was seeing] a bunch of flowers shining with their own inner light and all but quivering under the pressure of the significance with which they were charged... [And] the books, for example, with which my study walls were lined. Like the flowers, they glowed, when I looked at them, with brighter colours, a profounder significance. Red books, like rubies; emerald books; books bound in white jade; books of agate, of aquamarine, of yellow topaz; lapis Lazuli books whose colour was so intense, so intrinsically meaningful, that they seemed to be on the point of leaving the shelves to thrust themselves more insistently on my attention...

It does seem from the references supplied that the *raphe nuclei / locus coeruleus* system of the brain stem is involved, if not the principal controlling part of the SN network. As I understand it, so far the SN "is most readily identified using intrinsic functional connectivity analysis of fMRI data acquired *when a subject is at rest* (i.e., not performing any specific task). This analysis overcomes a limitation of task-based brain imaging data, in which the SN has been difficult to disentangle from other neurocognitive networks..." [29]

It may therefore remain to be discovered what the SN looks like in high-gain mode, influenced by a psychedelic drug for example, and how its gain or changes in intensity of operation might come about. It seems obvious that the SN must be able to operate at various levels of intensity, efficiency, according to the activities, pursuits and intentions of its owner. It remains experimentally verified that the *locus coeruleus* becomes highly activated with the occurrence of novel and salient events, and that the *locus coeruleus* appears to be closely controlled by the *raphe nuclei*.[30] It would be surprising if the *locus coeruleus* activation and the SN were *not* associated, apparently performing the same function but independently. And considering that the psychedelic experience depends on the serotonin 5-HT2a receptors totally: blocking these receptors prevents the psychedelic experience completely. There are abundant collections of 5-HT2a receptors on the *locus*

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27 Menon V. (2015) "Salience Network" In: Arthur W. Toga, editor. *Brain Mapping: An Encyclopedic Reference*, vol. 2, p. 597. Academic Press: Elsevier. Available in .pdf

28 For example, a search on *Google Scholar* for "Salience Network" and "norepinephrine" or "serotonin" turns up a large selection of recent papers, mostly concerned with treatment of various psychological problems. The emphasis is a result of just where the bread and butter for current research lies - treatments for expensive diseases such as depression, new pharmaceuticals, etc. Little pure research on the subject is being performed, even by psychedelic researchers who apparently havent yet discovered the Salience Network .

29 *ibid.,* p.597-8

30 M. Segal: "Serotonergic innervation of the locus coeruleus from the dorsal raphe and its action on responses to noxious stimuli". *The Journal of Physiology* Volume 286, Issue 1, January 1979

coeruleus, the entire neocortex, the *insula*, and the function of the *raphe nuclei* in multiple control and moderating functions throughout the body would seem to strongly support the idea that control of the SN is also similarly implicated.

A note of caution for future interpretations of brain-scan data: the observed participation of raphe/LC nodes in salience detection may not be as expected since "LSD and other indoleamine hallucinogens...have potent, direct inhibitory effects upon serotonergic neurons located in the *raphe nuclei* of the brainstem."[31] Other studies have shown the wide-scale presence of inhibitory neurons throughout the brain. It may be just a guess on my part, but is it possible that certain cognitive events or a person's voluntary doings might involve the "quieting" of a brain module/system/network/area, rather than its "lighting up" in brain scans due to consumption of more oxygen?[32] Perhaps we will therefore not see these small LC/raphe areas "lighting up" in fMRI scans when looking for SN activation. In some cases we may rather see the opposite. The notion that an "inhibited" area in the brain might be an important feature of some psychological/cognitive doing goes even further than has so far been suggested towards questioning the facile interpretation of brain scan data that designates areas which have become *more* active as the main or only important participating brain areas. Brain-scan machines are indeed very powerful instruments for which there is surely a primary place in research. But we must not let their new-found wonders lead us to heuristically careless misuse, nor the lure of the equipment define the research agenda, the tools available determine what we believe it is possible to discover.

Postscript

Quite a few of the recent psychedelic research papers I viewed contained statements about how "this" or "that" aspect of the properties and/or effects of psychedelics was "poorly understood". In general such a scientific-ese statement means, "we ain't got a clue".

> Psychedelic drugs also have a defined molecular target, the 5-HT2A serotonin receptor, and at least for psilocybin it has been shown that the binding of its active metabolite to this target directly correlates with the intensity of the psychedelic state. But here again, it is completely mysterious how agonism at a neurotransmitter receptor leads to profound changes in perception of oneself, time and space. It is equally unclear, how psychedelics exert their therapeutic effects in psychiatric disorders, which seem to be surprisingly long-lasting at least in some patients. – Psychedelics challenge our current thinking of the neurobiology of psychiatric disorders, the prevailing biological treatment approaches in psychiatry and the relationship between brain function and psyche in general.[33]

Indeed. The theory presented here aims to split the problem in two. With the Salience Amplification Theory we can now more readily understand what the psychedelic chemicals actually do, but our understanding of human consciousness, mind, psychedelic "effects" - remains, as it should, as it has always been, a woven web of guesses.[34] The great *scientific* utility of the Salience Theory is that it moves all the mystery back into the realm of human existence and psychological complexity. No longer need we think the *psychedelics*

31 *op. cit., 50 Years of LSD,* p27.

32 The BOLD fMRI imaging technique

33 Gerhard Gründer "How do psychotropic drugs work?"

34 As Xenophanes wrote, "But as for certain truth, no man has known it, nor will he know it; neither of the gods, Nor yet of all the things of which I speak. And even if by chance he were to utter the final truth, he would himself not know it; For all is but a woven web of guesses."

inexplicable, unpredictable, mysterious, sacred or evil... the drug is merely that, a substance that acts straightforwardly and predictably, and all the "mysteries" - all the "effects" in Masters & Houston's List - *are properties of humans*, not of mere substances. We should have known that all along.

If one supposes that psychedelics "cause" the items in Masters & Houston's list, he then confirms from yet another dubious perspective Francis Crick's "Astonishing Hypothesis": *the mind and its experiences cannot be anything but states of the brain's neurons,* and thus "our most cherished beliefs about God, value, meaning, purpose, culture and morality are shown to be without foundation"[35]

If consciousness, free will, et al., can be trivialized or eliminated by radical scientific naturalism, the "hard science" advocates, the "nothing-but-us-objects-here",[36] then the idea that a mere "drug effect", such as that of LSD, is "all that is really behind" the items on Masters & Houston's list, fits perfectly with their outlook: Even psychedelic experience, in all its disguises, would be in the final analysis *just another state of the brain's neurons*. How disappointing. And how *bland* an outlook for one studying the mysterious, the unpredictable, the ineffable...

But if in actuality, LSD causes only a measurable, definable amplification of a neurocognitive operation (as per the present essay) which the person then *uses and builds upon voluntarily* to enter the great range of psychedelic effects, his humanity is restored, as well as that of the researcher who recognizes where the mystery lies, the researcher who sees the elephant in all its revealed glory.

It is surprising that so many psychedelic researchers seem to support the stultifying scientism of the nothing-but-crowd, for that is precisely the attitude that is shown to be mistaken by the psychedelic experience itself. I can only guess that far too many of them have either not taken the drugs enough to know their possibilities to teach the *mysterium tremendum et fascinans* of human existence via direct demonstration, or perhaps not taken them at all in a misguided effort to be "totally objective".[37] If you want to study consciousness, it is advisable to do it from a conscious state, i.e., being under the influence of consciousness would not disqualify you from studying it. If you want to study psychedelic consciousness... you had best know fully what it might be. Might some researchers become overenthusiastic, as happened to a few in the 1960s? Of course! It should be expected! It is, of course, the responsibility of a scientist to temper his enthusiasm when necessary, but also not to shirk from the duty to advance new knowledge that conflicts with current paradigms, as lonely as that task has often proved to be. Without the occasional scientific revolution, science itself eventually becomes stale dogma.

Incantations and magic spells

The Salience Amplification Hypothesis, if it is eventually supported by neurocognitive findings, qualifies as a paradigm shift from the former Set and Setting, "Psychedelics Cause Effects" paradigm. Set and setting as such do not disappear, of course, and will continue to be a part of how psychedelic sessions are organized and experienced. Set and

35 Raymond Tallis in *Aping Mankind*. Note, Tallis declares himself an atheist, but here seems to be writing on the behalf of humanity, hence "God" is mentioned. *Aping Mankind* is the place to go for a thorough debunking of the reductionist Crick & Dennett et al. viewpoint; for a devastating critique of using brain scan data in an attempt to demonstrate the operation of any and all higher psychological properties of human beings; for what so far must be the final word about the (non)-possibility of finding the "neural correlates" of consciousness, not to mention the even more mysterious happenings of psychedelic consciousness.

36 An Alan Watts gem.

37 "Should psychedelic scientists trip on the drugs they research?"

setting for therapeutic or heuristic sessions may well be achieved in a more efficient and effective manner once it is understood how such session programming depends on the SA scenario. But the idea that set and setting are the direct cause of psychedelic effects will be recognized as little more than a throwback to shaman's techniques, another paradigm altogether.

Clarifications and Complications

As mentioned above in footnote 16, any theory about mind and matter must certainly be a radical simplification. Let me clarify the Salience Amplification theory with the following observations.

Any drug, method, discipline, ritual practice or whatever that changes consciousness may lead to amplified SD and a situation of positive SD feedback leading to psychedelic, or mystical, or whatever term is deemed appropriate, experience. Thus we can understand, for example, how shamans could have used even tobacco as a "psychedelic" plant.

We can also better understand the parallels between taking a true psychedelic and what can result from meditation and other "non-drug" methods, since the results, the "effects" of all such methods proceed through SA.

We can also understand how much higher doses of psychedelics often are necessary for certain persons such as alcoholics, since their normal SD level may be quite suppressed either by the repeated intake of alcohol itself or the general state of mind the alcoholic finds himself ensnared in.

We can also understand how experienced psychedelic users seem often to need much smaller than normal doses to achieve a psychedelic state, i.e., a state where SD is highly amplified. Thus we may suppose that there is a result of heuristic psychedelic use over time we may call "psychedelic training" where an individual learns to more effectively "use" his SD system to achieve better creativity, better "connectedness", and all the other sought-after improvements in one's life situation and outlook that psychedelic voyagers seek.

Also, although possibly based on mere rumor, some individuals such as a famous mystic seem to be able to take a quite significant dose of LSD and report that their consciousness hasn't really changed much: they apparently have amplified SD all the time...

One of my correspondents read the SA theory and replied that he thought the idea had merit, but only for small doses. The size of a psychedelic dose for ideal conditions under the SA scenario may well be for small to moderate doses. High doses could possibly involve side-effects, chain-reaction of activation of other neurocognitive operations including unnaturally strong emotional activation such as irrational fear. A high dose may even over-activate or saturate the SD system - analogous to a too-high audio gain with VU meters pinned in the red and saturation and distortion being the result. Nevertheless, the principal SA effect must still be operating, even if it is corrupted or otherwise overwhelmed.

Drug noise: some drugs seem to be very noisy. Attempting to use some of the historically employed psychoactives - such as the tobacco example mentioned above - to achieve a psychedelic state may be quite out of the question for most people. Again, ideal conditions for the SA scenario would universally employ a low to moderate dose of "low-noise", true psychedelic such as LSD.

I have neglected to mention Stanislav Grof's 40-years-ago observation that psychedelic chemicals might be thought of as "non-specific amplifiers of the contents of consciousness".[38] For the time, this was not at all a bad evaluation for it certainly departed radically from the drug-causes-effects-according-to-set-and-setting paradigm. Yet we see

38 Grof: *LSD Psychotherapy*. Pomona, CA, Hunter House, 1980

now that amplification is not non-specific but the contrary. And just what Grof was implying by the term "contents of consciousness" is not clear. Indeed, I don't believe it is helpful to think of consciousness as a container. And if *all* ongoing aspects of consciousness were involuntarily amplified we might well expect merely a confused state of mind.

One might however be somewhat mystified why such an idea, expressed so long ago, did not lead to research that attempted to discover whether amplification of some discoverable cognitive process might in fact be a useful model of the psychedelic experience, especially since the idea was explicitly suggested by Huxley, Watts, and in *50 Years of LSD*.[39] The present theory of Salience Amplification attempts to redress the lack of followup.

Finally, the ideas expressed here have resulted from the long-obvious-to-me but long-ignored-by-everyone-else difficulty in attributing direct, logical and demonstrable causation from drug to receptor to experience. It should be obvious by now that choosing some current parts of experience while under the influence of a psychedelic, those that seem unusual perhaps, and calling those "psychedelic effects", while at the same time dismissing other aspects of current perception as merely "normal consciousness", cannot logically be a model of psychedelic experience. How would we differentiate the two domains? Some "normal" parts of perception might at other times or for other persons be "psychedelic"! Grof's idea, long ago, was not a bad guess, but of course made no reference as to just what was being amplified. The Salience Amplification hypothesis may now finally amount to a good starting point for research. Conscious events or perceptions subsequent to psychedelic ingestion obviously cannot be attributed directly as drug effects, nor from the exterior as if the psychedelic voyager were travelling in "unknown territory"; the psychedelic experience is more like a pathway of amplified and reinforced salience that can be intentionally followed, arriving at interior destinations that were inherent, always potential, yet for whatever reasons ignored or seldom visited in everyday consciousness. If we are to grant that meditation and other "non-drug" methods can provide equivalent experience, then unless we posit the supernatural, there can be no conclusion other than that psychedelics do the same, activating an interior path the person follows at will. Otherwise, we would have to suppose that the psychedelic experience was akin to watching a Hollywood film, with a writer, director, and actors who were responsible for the experience that the person "watched". "Psychedelic effects" are always *voluntary,* in the sense that they are something the subject *does,* not something that merely *happens to him.*

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39 See references 12-15.