

Conscious Dreaming and Controlled Hallucinations

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Hiroé Aquasaca

This work is dedicated to my cherished Hiroé Aquasaca, from Kasoukabé, Tôquiô, who gave me the inspiration to share it with other exoreal people. Had I not met her, you would very probably not be reading this study! It is also dedicated to another cherished Chinese girlfriend of mine: Patanê Pongpatchamnanouâte from Souqsauate, Bângkoc (this work is also dedicated to my dear friend Cyrano de Bergerac, a brilliant thinker of the 17th century). Both are my inspiration to inform you about this important



Patanê Pongpatchamnanouâte

work. What we call *Amour* (love) is an extraordinary hallucination, and from such beautiful hallucinations things can be born into the exogenous reality ... like what you are going to read. *Alors chères Patanê et Hiroé un jour vous ferez partie de l'Histoire!* For whoever authentically knows about Conscious Dreams, money, glory, recognition and similar bla, bla, bla are nonsense! This is the main reason why I did not bother to put my work into a book (as Dr A.Hobson from Harvard repeatedly suggested to me!). Maybe this will be done in the future if people manifest their interest in this topic. Otherwise? There's no use in me wasting my time if only a few people are interested! Reading this, you will clearly understand why!!

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Conscious dreams

I have done scientific research into conscious dreams since I discovered them in 1976 and was published in 1979, 1980, and 1981 in France (*Agressologie*, Masson, eds. Paris) and in 1976 in Italy. In my articles I described what distinguishes this form of dream from normal oneiric phenomena and I also analysed different states of consciousness. The work I did is, apparently, the most advanced that has been done within the scientific field. Of course, conscious dreams have been explored for a long time by the Tibetan monks, but they had no knowledge of present-day scientific analysis. Conscious dreaming is, wrongly, called "lucid" dreaming in English. I will describe here a simple and efficient method for inducing this kind of dream. Moreover, I strongly believe that when most people are able to enter, voluntarily, in the virtual world of their dreamworld, this will drastically change society. Manipulating your own mind in conscious dreams cannot be compared with the highly primitive manipulations of computer generated virtual realities ...

It is far easier to enjoy the virtual reality in your own mind than to try to enjoy primitive virtual realities generated by computers! To that effect, you need no money, nothing, except practice! Moreover, by doing so you start to learn a lot about what consciousness is as, for instance, in dreams you are frequently conscious of things which are non-existent in the reality of the awake state. How you can be conscious of things which never existed is an important discovery which opens the scientific exploration of what exactly "consciousness" is. I analysed this, in detail, in my 1980 article.

Scientists have been engaged in big projects to unravel, for instance, the entire DNA structure of the human genome. In my opinion, this is interesting but **is not** a priority in a technological society as primitive as ours because we are "advanced" technologically but nearly complete ignorants in the domain of the workings of our very own brains. A technological society **needs** to have as deep a knowledge about the central nervous system (CNS) as it has about exogenous reality, or exoreality. The knowledge about our consciousness and thinking process is minute and the main reason for that is **not** because this is a difficult thing to achieve but because **there is no top priority project meant to study the central nervous system**. I have been recommending for years that we should launch the equivalent of an "Apollo" project for the brain. We need to devote large amounts of money and put scientists in many different fields at work on the same project: unravelling the function of consciousness. I am optimistic that this can be achieved!

Researchers in the brain field should **combine** two methodologies:

1. Introspective observations such as first-hand observations while in the conscious dream state (the famous French philosopher René Descartes, in his "Discours de la Méthode", explained very well why first-hand observation and reasoning is of crucial importance for the scientist) and observations and descriptions of the effects of all known psychotropic molecules.
2. Exogenous observations of the CNS, as is already done.

Both methodologies should work hand in hand to constantly generate new synthesis, concepts, and ideas. This is what I started, on a lone path, in 1976. Why? Because I found no serious scientist interested in pursuing such an ambitious and complex quest.

What the public does not know is that the **vast majority** of scientists are only *fonctionnaires* (civil servants)! They have no real intellectual curiosity and are mostly interested in promoting their status and making money. These *fonctionnaires* love hierarchy, like the military! They like to establish pecking orders like chickens instead of listening to one another. But Science, **real** Science, has nothing to do with the army or with the behaviour of birds... Science is the human quest for knowledge: everyone can participate and add his stone to the erection of the building of progress. I think I have opened new ways of exploring brain function and I believe that when there is more scientific interest in the field, we will observe a fast explosion in the domain of the neurosciences as a whole (often new knowledge comes when individuals have enough intellectual freedom and curiosity. The ibogaine story is an example of this as all research on ibogaine started after a lone individual made a few interesting observations...). Those savants should be courageous and highly motivated to get to grips with their own consciousness. I have explored the shores and the surroundings of a mostly uncharted land. I invite all other serious researchers

to join me in that exploration. The first call, in 1979, went unheard, so I continued on my way as there was no other choice. Convincing people of this and that has never been one of my chief interests and I believe people should convince **themselves** if they are authentically interested in what they are studying. So I am spreading my present knowledge like a gardener spreading seeds... Reasonable people will take those seeds and make them grow. Unreasonable people will throw the seeds in the dustbin!

I am what people usually call a "pioneer". Pioneers are not special people! They are only highly curious and motivated individuals who are not afraid to take untrodden paths. Why are they not afraid? Because they know how ephemeral life and all human things are. They have no time to waste in futile arguments, social beliefs and other human stereotypes. They know that human beings are only animals doomed to death, like all animals. They know that human behaviours and thoughts are rarely ever objective but always reflect the desire of dominance, as my late friend Dr Henri Laborit discovered. (Human beings struggle in despair to achieve dominance, something reminiscent of the behaviour of wolves or monkeys. The vast majority of "scientists" behave in this way too so it is often useless to waste time with them! As for me I have never been interested in dominance and this imbecile competition which pervades the whole planet now, thanks to the "American" businessmen. I have always favoured communication and sharing, building things together while forgetting about our ridiculous egos. Ego means only destruction. It is totally negative). Their Grail is **Knowledge**. Their enemy is death, because we are mortal. They have to pursue the quest of Knowledge as fast as possible **before** death puts them back into non-existence ... until the "end" of eternity. Jean de Ribault, the famous French Protestant who established the first European colony in North America: *la Floride Française*, "French Florida" (1562) knew all about it ... When the Spanish Menendez came to destroy his settlements and murder most of the French Protestants, Jean de Ribault reminded him that this was a useless action as both of them, in the end, would be nothing more than dust in the wind ... Menendez, embedded in his ego, ordered Jean de Ribault to be killed together with all French over 15 years old and so perished the innocents. Their dust is still somewhere in what is nowadays called Carolina ...

One of these pioneers, to which I dedicate my work, was Joël Scherk, an early French physicist with other pioneers of the Superstrings theory. He died too early from diabetes, at around 30 years old. How **tragic**, how **unfair**. But human life **is** tragic and is unfair because we are still ruled by primitive animal instincts and, still, doomed to die. Death is a form of genetic disease which, I believe, will be harnessed in the future. Unfortunately, this does not apply to us: all of us reading this will die anyhow and return to dust ... which was born a long time ago in the stars! This is the deep absurdity of human life, as Camus pointed out. Life is absurd but we have to struggle, like Sisyphus. We do not know the origins of Reality, the Objective Reality (not to be confused with what we call "universe") but, in a far future, our descendants, I think, might well understand all these things which are, for us, a highly primitive species, still "mysteries". Reality seems to be much more complex than what we know today. Examining the ideas behind, for instance, the known 4 forces or things like Non-Locality (*Non-Séparabilité*) gives rise to novel ideas about the structure of exogenous reality. Unravelling the workings of the CNS is the **first step** in the conquest of the future. Exploring our endogenous reality is a **prerequisite** for all researchers who want to study consciousness. Those who do not care or refute this exploration are **not** serious and they are just playing with concepts unrelated to observations... Moreover, consciousness is to be unravelled through the neurosciences **not** through grotesque ideas coming from something totally unrelated as quantum mechanics. . .

I here hark to the games of Penrose, who wrote a Manifesto of the Grotesque! No credence can be given to any person who has not, first of all, explored his **own** consciousness in the way described here. Penrose and other physicists are talking about things they do not have the slightest knowledge of. Certainly they are good at physics, but they are not qualified to study consciousness, being **totally ignorant** with respect to their endogenous reality. How can you dare to talk about consciousness when you have **never** even explored your own? The immersion in conscious dreams and in experiments with psychotropic molecules is a prerequisite for **any serious discussion about consciousness**. The late Dr. Joseph Moreau de Tours knew all about it! So what about Penrose and others? To the dustbin! as could have said my favourite writer Cyrano de Bergerac, in 1648!!! A lot of noise for nothing ... and anyhow all of us, like Jean de Ribaut and Menendez, will soon be only dust, as my friend Cyrano de Bergerac has been since 1652! *Hommes poussière ... rien n'est vrai, tout est vrai! Rien n'est blanc, rien n'est noir! Tout n'est que nuances de gris ... et vous n'êtes que des cirons, des puces "aux fesses de la nature" comme disait encore le brillant Cyrano!*

How to achieve conscious dreams

In order to become proficient in conscious dreaming you need to exercise at least one hour per night, very, very regularly. Regularity is of prime importance in order to be able to voluntarily penetrate your endogenous world or **endoreality**. Going at will into your endoreality is one of the most rewarding experience you can have in your life, as you enter in the reality which is completely yours and where nobody, no Inquisitor can follow you to prevent you from just enjoying yourself. When you can achieve this, the exogenous reality or **exoreality** becomes less "real", less stressful, less boring, as you can, now, willingly consider exoreality as dream-like, even if it is not a dream! But being able to consider exoreality as oneiric-like, oneiric-mimetic, gives you much more freedom and self-confidence as you have now new values, new ways of seeing important things, like, for instance, the death of your loved ones or your own death or, generally speaking, people and objects situated in exoreality.

So here are the exercises you should do regularly to learn to consciously penetrate your endoreality:

1. Before going to sleep, sit or lie in your bed for at least 30 minutes.
2. In total darkness, just **focus** your attention on darkness and try to **visualise** simple images, like the image of a triangle, a square, a leaf, or anything you like. For instance, focussing your visual attention on sexual images will ameliorate your concentration!
 - If you are a man you can focus your attention on images of a breast, of buttocks, of legs, etc.
 - If you are a woman, you can focus your attention on a part of man's anatomy which triggers your sexual desires.

The purpose of this exercise is to teach you how to specifically activate some of your memory zones in order to achieve the generation of controlled hallucinations. This is a very difficult exercise but it will train your consciousness to control itself. Focussing your attention is extremely important in the discovery of your memory and consciousness. It should be accompanied by

breathing regulation: you need to breathe slowly and regularly, as if you were sleeping. Apparently controlled breathing triggers hallucinations, as experienced by meditating monks.

In the beginning, if you focus your attention on, say, a triangle, you will observe the appearance of a faint triangular shape in the darkness and you will discover that this triangle will have a strong tendency to move, rotate, or simply disappear to be replaced by another faint image. Such faint images are called **disattenuated** images. A clear and controlled hallucinated image is called a completely disattenuated image, while faint images are called partially disattenuated images. We will explain this later. A normal visual thought is called an attenuated image.

To see a memorised image as clearly as a real image means that you activate the metabolism of a memory zone where this image is stored. Selective metabolic activation of memory zones gives you a lot of power in your dreams and, also, surprisingly, in the exoreality where we all live.

3. While focussing your attention on **informational objects** (a stored image of an object perceived in exoreality) try your best to forget the boundaries of your body.
4. Try not to move at all and breathe deeply and regularly, like someone who is sleeping.
5. When 30 minutes or more have elapsed, just go to sleep - but you still have to wake up in the early morning!
6. Wake up early in the morning, between 4 or 5, and just repeat the whole exercise.
7. When you next wake up write, as fast as possible, everything you can remember of your dreams. Slowly, slowly, you will discover that you remember more and more dreams in increasing detail.
8. During the day, when you have time, just focus your attention on complex objects such as flowers, the ripples of water in a river, the shape of trees, leaves, examine carefully the content of books, etc. This teaches you the same thing as before: how better to focus your consciousness on reality.

While doing these focusing exercises you will discover a lot of things like, for instance, the appearance of reiterative rotating images which is an **invariant** phenomenon preceding the emergence of complex disattenuations. Reiterative images are, probably, a prerequisite for synthesis of complex 3-D images. My intuition is that, in some ways, reiterative images mutually interact to form complex images. Reiterative images could be explained, I think, with a concept called MHV and MHV metabolic activation. Such images can also easily be seen with serotonergic hallucinogens and it seems that an artist such as Escher just drew such reiterative hallucinations... So it is my opinion that Escher had sub-hallucinations but that he did not mention it, for obvious reasons! Talking about hallucinations nowadays is somewhat reminiscent of talking about the Devil not so long ago... Hallucinations are, still, in the domain of demonology in our "modern" societies, one of the last taboos to eradicate.

Before reiterations appear you will notice that the darkness on which you are focussing becomes first 3-dimensional, then starts to "boil". By "boiling" I mean that you start to observe sub-hallucinations, constantly appearing and disappearing by MHV transformations. These sub-hallucinations are reminiscent of the surface of boiling water! Not only do these hallucinatory forms constantly change but they are very much *imbriqué*, intertwined. The same step can be noticed by conventional serotonergic hallucinogens like *psilocine* which is, for me, the reference serotonergic hallucinogen. "Boiling"

informational objects and reiterations are the sign of only slight metabolic activation. The same phenomena can be observed at the end of a dream period: if you wake up immediately from dreaming you can still observe (for up to 6 minutes or so) boiling and reiterative informational objects in slow rotation (often from right to left in my case). I call this phenomenon the "disattenuation closure" (*fermeture de la désatteacutenuation*).

After some weeks or months of such training you will have your first conscious dream, in the second phase of your exercise, that is, in the early morning. You will remember it as an extraordinary experience as you will discover that reality is only made of perceptions. Reality for all of us is what we consciously perceive. It does not matter where the incoming information flows from: from exoreality or endoreality. Evolution has put a mechanism which erases the consciousness of our dreams in our central nervous system (CNS). If the mechanism did not exist, all of us would have chosen to live in our respective endorealities and our species would just be extinct!

Just see how people are running into exceedingly primitive computer-generated virtual realities. Imagine what would happen if all people could go, at will, into the ultimate virtual reality of their own mind!!! The mercantilistic society which now prevails would just become extinct as, in our endoreality, we can achieve everything we want at no cost at all. The only cost is learning. In such a future, life would be more tranquil as people would obviously cease to compete and desperately run after "exoreal" objects in order to run, instead, after their own informational objects... When you have access to the informational objects stored into your memory you no longer need money and power to realise your desires. It is far easier to learn how to gratify yourself with informational objects than working like mad to become a millionaire who will have **less** than you because he can only possess exoreal objects! A proficient conscious dreamer is in a world which is constantly extraordinary. This quality of endoreality is called **extraordinarity** (*extraordinarité*, a quality of endoreality as opposed to non-extraordinarity, which is a quality of exoreality). Moreover, this world is serene, irenic, as it is your own created world. Nobody can run after you in the realm of your endoreality except your fears, materialising in nightmarish forms, as long as you are not aware that they are the product of your stored anxieties.

The new alphabetisation of mankind

The discovery of our endoreality will be the new "alphabetisation" of humankind as this will be a complete revolution which will transform our societies in ways we cannot yet imagine. Endoreality exploration is the **first** prerequisite in order to analyse and understand what "consciousness" is. This exploration establishes contacts between our conscious and unconscious selves. It is an **extraordinary** exploration from which you come back to exoreality with some sadness, as exoreality is so crude, so simple, in comparison to the beautiful complexity of your endoreality.

All reality for any given individual is in their own "mind", that is, their own memory. So the exploration of ourselves becomes the most rewarding thing one can achieve in our lives. Talking with your Unconscious teaches you a lot about what "reality" and human life are...

Nowadays people are not yet alphabetised as regards their ability to penetrate into themselves. Their conscious self is **completely at odds** with their unconscious self. All these great scientists studying exoreality are still **primitives** as regards their knowledge of their own selves. They know only the verbal language and the usual sequential analytic tools we use in the Sciences but they do not know how to use their Memory in order to do Science in a different way: more visual, more rapid, more creative. Who knows, for instance, that cannabinoids used with benzodiazepines and with the help of some self-knowledge can enhance creativity? Cannabinoids make you enter a "creative zone" of the mind because they intensify the metabolism of the fabric of memory which are called "Intersections". Cannabinoids stimulate thought to "radiate" into the imaginary space-time of memory through those intersections. Through intersections your thought can spread into many different areas of your memory **simultaneously** thus giving you a higher perspective of things. I wish **all** scientists would **learn** how to use cannabinoids to go faster in their research.

There are two ways to penetrate a conscious dream

1. In the first case, when you do your second round of exercises, while now lying in your bed, you will notice the following phenomena which will tell you that you are on the verge of crossing the frontier between exoreality and endoreality: you may notice a buzzing sound in your ears or, more often, you will suddenly feel that your body "becomes light" and moves upwards. Then you may, all of a sudden, see a very bright three-dimensional image just in front of your eyes. Do not become excited, do not panic! Stay very calm because if you become excited or even just move your finger, then the marvellous image will instantly disappear and you will have lost the opportunity to make your first exploration of your endoreality! Be tranquil, observe the image. Suddenly, you will become a part of this image and you will find yourself with an informational body, that is an oneiric body which is, exactly, like your exoreal body. Do not be too excited. Breathe slowly now that you are in your dream reality! Then go and explore.
2. In the second case, you will feel the same phenomena but no image will appear and you may just think you are still in your exoreal bed. Don't be so sure! Leave your bed and try to put on the light. If you fail, this may mean you actually penetrated your endoreality as, often, in conscious dreams lights do not turn on. If there is no light, just open your window. Then look at your room for details. Is everything in its correct place? If your room differs from your normal room then you can be sure you are in a dream and, of course, if you slept at, say, 4:30, and when you opened your window you discovered a full sunny day, with modifications of the surroundings, you will now know for sure that you successfully consciously penetrated your own memory! Then do the same as was explained before: go and explore, quietly. If you do not remain calm, you may just wake up.

What to do in a conscious dream

This is not obvious. The first thing you should do in a conscious dream is just observe your endoreality and compare it with exoreality. Try to meet oneiric people, speak with them, kiss them if you like, think about how they can perceive you: do they really have "sensory organs"? Compare their behaviour with

the behaviour of exoreal people. Test their will. Do they have "free will"? Do experiments with them to evaluate their "psychology". Ask them questions: do you know we are in my dream? What do you do when I am awake? Are you aware that we all share the same central nervous system? etc, etc. After a while you will fully realise that endoreality and exoreality are similarly vivid, "real" and that you were, before, just like a child who never learned to read. You did not know that so many things happened in your mind when you were sleeping! You always, erroneously, believed that dreams were "only" dreams and could be distinguished from exoreality. And you believed so because you suffered from amnesia due to lack of training. You will realise, especially if you are a neuroscientist, that there are no clear-cut differences between the two realities except that both obey to different laws: exoreality obeys to the physical laws discovered by Science and endoreality obeys to the laws of the neurophysiology of memory. You will soon discover that exoreality is devoid of **extraordinarity** while endoreality is full of the extraordinary. (Extraordinarity is a new philosophical term in contrast to non-extraordinarity). In your endoreality any extraordinary thing can happen: you may speak to a cat or be transformed into a woman, if you are a woman; you may transform yourself into another person or into a passion-fruit flower; you may become, simultaneously, two or three persons **at the same time**, etc.

You can divide yourself into two persons, say a woman and a man, and then just make love with yourself! This is an extraordinary fulfilling experience which cannot be described in exoreal terms. You have to discover it by yourself. All these virtual experiences will make you see exoreality into a totally transformed way as endoreality will then appear to be a space of great freedom while exoreality will be considered a form of prison, because exoreality is totally devoid of the extraordinary.

Slowly, slowly you will also get a sense that exoreality is, perhaps, not as real as we think but that it might be just a part of an unknown hyper-reality of which we are totally unaware. Studying my endoreality guided me then to start to be interested in physics because physics teaches you about the nature of exoreality. Why is exoreality so **rigid**, so **simple**? Is the rigidity of the structure of exoreality real or only an appearance? Physics can start to give mind-boggling answers to these questions! As for me, now my opinion is that what we call our "universe" is only a small part of a much vaster hyper-reality. I believe much higher forms of intelligences should be able to create exorealities at will, for instance by setting physical constants and creating the forces they want... It is written nowhere that the 4 interactions we know are the only ones in existence in the Objective Reality (not to be confused with our "universe"). It is written nowhere that the values of the physical constants should always be as they are...

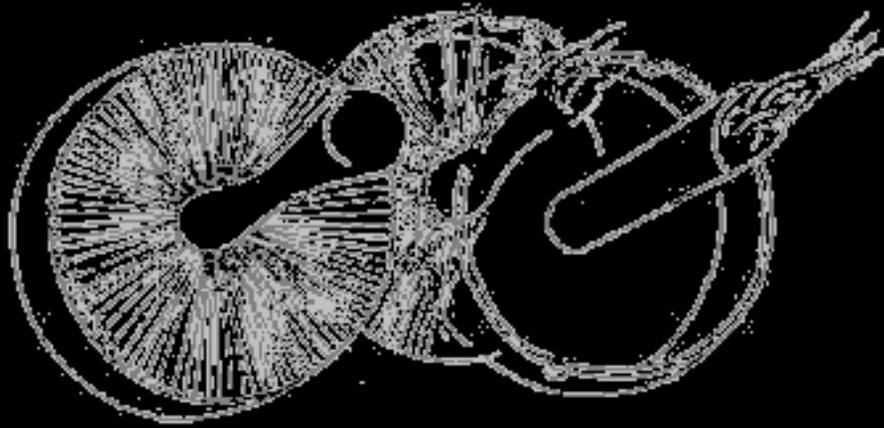
I now believe intuitively that all this is only an appearance, like the shadows of Plato's cave, and that forces or constants can be modified at will, giving rise to an extraordinarily complex exoreality: Hyper-Reality. Intertwined but totally disconnected realities may exist, and a lot of other strange things! I think we are at the edge of a revolution in our understanding of the structure of exoreality. Already modern physicists can imagine such hyper-realities of which our own reality would only be a small, "illusory", part. For instance, André Linde, a renowned physicist, described a model of the universe (called the inflationary fractal universe) which looks just like how we might imagine hyper-reality.

When you are in a conscious dream, you will first enjoy yourself, meeting loving women or men, making oneiric friends, visiting Tahiti or Hawaii, the Moon or Mars, etc. Of course all these experiences are

imaginary but so is your own life in exoreality! After that, you should analyse the oneiric world, for instance you can try now to evaluate what the degree of freedom that you and your oneiric partners have in the endoreality is. Doing this, you will one day discover that oneiric people are **hybrids** between yourself and what you think you know about others. For instance, oneiric people can answer any question the same exoreal people could not answer. They can be influenced by your thoughts, etc. They are not always free to behave like they do and, most often, their volition is very weak in front of your own volition. One of the most important things in endoreality is that you can study, first hand, how your memory works. In a way you become your own Sherlock Holmes and this is highly exciting as you are scientifically exploring a world where no scientists have gone before you! You are on your way to become a pioneer of the "mind".

One important thing to do in conscious dreams, for scientists, is to analyse the oneiric reality first-hand, from inside, as this is the best way to study how a biological memory works. The first thing a scientist discovers in endoreality is that the oneiric environment is **metastable**. Every informational object of a dream is continuously in a metastable state and can change to another metastable state through a "MHV jump". Endoreal informational objects are often relatively stable as long as the dreamer maintains his attention focussed on them. Say if I have a watch on my wrist, this watch will tend to remain the same as long as I am looking at it. If I hide my oneiric arm with the oneiric watch for, say, 30 seconds of oneiric time and then look again at my wrist I will notice that a sudden MHV jump has occurred: my first watch would have transformed into another watch, different, but still a watch because in our memory all homologous informational objects are stored in a common place.

All homologous objects colocalised in a same domain are called, collectively, a *Motif Homologiquement Variant* (MHV) or a homologously variable pattern. For example, in this example, all the watches I have seen in my life constitute a "single" MHV and a single watch extracted from this MHV is called a "slice" of the MHV. The memory area where an MHV is stored is called a MHV domain. Any MHV can contain a huge amount of informational objects which are extracted into consciousness with metabolic energy. To illustrate this with a simple familiar example just consider a game with soap which has been played, for generations, everywhere by children: in this game, children plunge an annular piece of plastic in liquid soap then blow inside and what happens? Lots of bubbles, with different sizes, sprout out! In the same way, when you inject energy in a MHV (you "heat" the MHV) this MHV starts to "bubble" its slices out into consciousness! A bubbling MHV is called a radiating MHV. The MHV are the shortcuts of dreams and, often, an oneiric scene will change to another oneiric scene through a MHV jump, that is a transformation obeying a law of homologous patterns. MHVs contain enormous quantities of informational objects which have a similar pattern in common. For example, a mushroom and an ashtray with a candle in its middle are very close in shape (pattern) and they are, thus, colocalised. This is why if I observe one visual thought (see drawing) consisting of an upside-down mushroom, for example, and if, all a sudden, this mushroom disappears and is replaced by an ashtray with a candle inside this is because their patterns are very similar and it needs only a small amount of metabolic energy to shift consciousness from the first informational object (the mushroom) to the second informational object (the ashtray with the candle).



TRANSFORMATIONS MOTIFIELLES (Homologous Pattern Transformations)

In this drawing we can observe the "cheminement" (path?) of a simple visual thought consisting of the image of a mushroom. This thought was observed in complete darkness. Focussing my attention on the darkness I suddenly observed a static mushroom as drawn. Rapidly (less than 2 seconds later) the mushroom disappeared, to be replaced by the image of the ashtray with the candle. Both images evolve in the imaginary space-time of memory through INTERSECTIONS. An intersection is an informational place of memory where informational objects can transform into one another because they share a COMMON simple pattern. Transformations of such visual thoughts, following homologous pattern rules, are called *transformations motifielles* in French, which may be translated into English as "Homologous Pattern Transformations". Such *transformations motifielles* have been observed by some artists (such as Grandville, Dali) but went unrecognised. *Transformations motifielles* are always observed when one focusses his attention on his thoughts. They are also, similarly, observed with serotonergic hallucinogens and cannabinoids or under ... strong stress, meaning that stress enhances the metabolic status of memory. With serotonergic hallucinogens such transformations seem more static while they are more animated under cannabinoids.

These *transformations motifielles* **demonstrate** that thoughts obey rules and are **not** random. This is an **extremely** important observation as it shows that "free will" is a figment of our imagination. A thought can proceed into the imaginary space-time of memory **only** through intersections. This demonstrates the perfectly **physical** nature of thoughts...

We do not need mysteries, such as Deities or quantum mechanics(!), to describe thoughts. The same applies for consciousness which is a collection, a sum, of simple mutually interacting thoughts.

Memory is composed entirely of MHVs which are also all intertwined. This gives rise to the discontinuity of our thoughts. For instance, the vision of a mushroom is a simple visual continuous thought. As long as that mushroom remains the same my visual thought is **continuous**. When, suddenly, my consciousness drifts away through a MHV jump then it becomes **discontinuous** through the help of cannabinoids which enhance the metabolic status of MHVs. The idea of an MHV is extraordinarily powerful, as it then permits the scientist to begin to understand how the oneiric or schizophrenic consciousnesses are structured. A schizophrenic thinks in the same way as a normal dreamer: his consciousness just follows

the way memory is organised: into MHVs. The difference between a schizophrenic and a normal waking person is that the MHVs in a schizophrenic mind are more active metabolically and so MHVs start to "radiate" meaning that discontinuity of thought is enhanced. MHVs radiation is also found in those religious mystics claiming to have reached a "complete understanding" of the "universe"...

There are a lot of things to explore and analyse in conscious dreams. I will now explain some of the things I have discovered since 1976, when I first penetrated a conscious dream.

About different states of consciousness and "new" concepts (1976)

I will explain later, in more detail, why I call hallucinations "disattenuated images". Basically, this stems from the fact that our brain is equipped with a structure called the **attenuator**, the function of which is to control, like a kind of potentiometer, the quantity of information flowing from memory to consciousness. An imaginary image of an exoreal object is, thus, a fully attenuated image while the same hallucinated image is called a fully disattenuated image. When we dream the attenuator ceases functioning and so information flows freely and unhampered to consciousness. Hallucinogens are, in fact, disattenuating molecules while serotonergics, like the specific serotonin re-uptake blockers, are pro-attenuation molecules meaning that they increase the degree of attenuation of recalled stored memories (One exception, in this class of molecules, is the atypical serotonin re-uptake blocker fluoxetine which, to the contrary, induces subhallucinations and better recall of dreams. The probable reason for this is that fluoxetine should, logically, preferentially enhance 5-HT_{2A} receptors activity-linked to dopaminergic activation while other similar molecules, very probably, enhance dopaminergic inhibition). Conversely, disattenuating molecules increase the degree of informational flow from memory to consciousness. This process is called "disattenuation".

The brain is also equipped with another very important structure called the *dérépixelisateur* in French, which could be translated as the "derepixelator" or DRP. The DRP is responsible for the continuity of our consciousness during waking time. During dreaming, the DRP also stops functioning, thus introducing discontinuity in our thoughts which become fragmented, like in schizophrenia (due to enhanced metabolism in MHVs). In fact, schizophrenia is, essentially, a disease of the DRP which is malfunctioning. The DRP is thus responsible for the normality of our consciousness during our waking periods. We do not know yet which brain structures are involved in the DRP but one structure which seems to be a part of this system is the hippocampus (incidentally, the hippocampus contains cannabinoid receptors and such receptors should, logically, be involved in the generation of schizophrenic consciousness).

The DRP controls the informational structure of our consciousness and maintains the stability of this structure by preventing MHV radiation. In every individual there is a baseline level of MHV radiation which maintains him in contact with exoreality. If this baseline level of radiation is increased, then thoughts become discontinuous and we appear to be "crazy" to an exoreal observer! MHV radiation is **increased** in the normal dreaming state but **decreased** in the conscious dream state. This means that during a conscious dream **those brain structures crucially involved in the waking state form of**

consciousness are in a lower metabolic state. This is a very important realisation, as it should now be possible, with PET tomography, to localise those structures responsible for the waking form of consciousness... Surely this will be a great achievement in the study of consciousness. The DRP is, very probably, a system which controls the intensity of metabolism in the areas which give rise to consciousness. When metabolic activity is low in these areas, then we have our normal structure of consciousness. The structure of consciousness is also called a "pixelation pattern" (*motif de pixélisation* in French). When metabolic activity becomes elevated, then our consciousness becomes metastable and dissolves into a mosaic of unrelated informational events. During our waking time, the DRP maintains a low metabolism in the areas of our brain responsible for consciousness. So the DRP (and also the attenuator!) is a metabolic modulator. Understanding how the DRP works is understanding many different states of consciousness, from the normal waking type of consciousness to the dream or schizophrenic types of consciousness. The functioning of the DRP and the attenuator are interrelated. Depending on these interrelations you will get different states of consciousness.

There is also another system which is fundamental in order to understand different states of consciousness. It is called the SBEM (*système de blocage des éfférences motrices*) in French and I will keep the same acronym in English. The SBEM is a neuronal system which blocks motor efferents during the onset of dreaming but which does not work during schizophrenic states, where it remains inactive. This is why schizophrenics express an oneiric way of thinking while awake.

Different states of consciousness are generated via the mutual interactions of the attenuator, DRP and SBEM.

The way the DRP, the attenuator and the SBEM work together determines different states of consciousness, depending upon the states of activity or inactivity of these integrated structures. For instance, the normal waking state of consciousness will be defined so:

Attenuator: Active
DRP: Active
SBEM: Inactive

The normal dreaming state will thus be:

Attenuator: Inactive
DRP: Inactive
SBEM: Active

The conscious dream state will be:

Attenuator: Inactive (consequence: increased metabolism in our memory areas)
DRP: Active (consequence: decreased metabolism in our consciousness areas)
SBEM: Active

The hallucinatory schizophrenic state will be:

Attenuator: Inactive

DRP: Inactive

SBEM: Inactive

The non-hallucinatory schizophrenic state will be:

Attenuator: Active

DRP: Inactive

SBEM: Inactive

Hallucinatory states, drug-induced, will be:

Attenuator: More or less inactive

DRP: Active

SBEM: Inactive

Make yourself proficient in conscious dreams as this will be the next human revolution to come, a revolution as important as the discovery of fire or of writing.

Why does dreaming exist?

Dreaming is a consequence of the existence of the attenuator! The purpose of the attenuator is to control the metabolism of memory during the waking state so as to block disattenuations and MHV radiation. As the attenuator consumes different neuromodulators, such as serotonin, during the waking state, it has to stop functioning periodically in order to replenish its reserves. So while it is "recharging", our brain metabolism becomes higher all of a sudden and we start to dream. The complex cycles of dream and non-dream periods during the night can also be understood within this basic framework.

Oneiric Maps (*Les Cartes oniriques*)

In normal dreams we can revisit previous oneiric places from time to time. These oneiric places seem to be quite stable in their structure. For example, when I visit imaginary lands they are often dissimilar from their exoreal counterpart but still oneirically stable. It is as if my memory built specifically imaginary maps of places and stuck to these constructions from dream to dream! If I am in a dream about Brazil, for instance, this oneiric Brazil will most often be similar each time I come back to it. It is as if in my mind I have a whole cartography of places and people which is rather invariant. This oneiric cartography is what I call oneiric maps.

What is the rôle of DMT in the CNS?

Hallucinogens are 5-HT_{2A} receptor agonists. Such receptors seem to be involved in the initiation and termination of dreams (through dopamine activation) as deduced from introspective observations. The main characteristic of dimethyltryptamine (DMT) is its short-acting effect which immediately makes you think that DMT has some specific role to play in the CNS. Endogenous DMT, or related compounds (5-Meo-DMT), is perfectly suited to be a short-acting efficient endogenous 5-HT_{2A} agonist produced in the initiation and termination of oneiric phenomena or in other processes meant to sustain the high metabolic activity found in oneiric phenomena. Due to the sensitivity of the 5-HT_{2A} receptors to downregulation by agonists the very short-acting effect of DMT at those receptors thus seem to lead naturally to the hypothesis that DMT is functional in oneiric phenomena. My idea, then, is that DMT is cyclically produced or used during the REM phase of dreaming. If this is so, abnormalities of endogenous DMT pathways could lead to spontaneous hallucinations or dream-like episodes. In this context it would be particularly interesting to study the eventual links between DMT and the diterpene salvinorin A as far as REM sleep is concerned.

MHVs are like tunnels linking MCV boxes!

MHVs are the shortcuts of memory. They directly link different oneiric scenes which we can represent by MCV "boxes". An MCV box is a portion of continuous oneiric space-time. MCV boxes are visually represented as boxes which explain their naming! MCV boxes are continuously synthesised by the dreaming brain. They constitute the locus of endogenous reality where the oneiric consciousness travels. Any dream can be represented (see diagram) by a combination of radiating "stars" (MHVs) linked to different MCV boxes. The center of the star is a slice of an MHV domain while the radiations represent the links between different slices of the MHV domain. In an MCV box oneiric time is, roughly speaking, continuous, discontinuity being introduced by the radiating MHVs. Any pattern contained in an MCV can be a part of a "specific" MHV domain. As an MCV is a metastable structure the dreamer can notice, when he "walks", in an MCV box slight discontinuities such as, for instance, the transformation of a rose into a crystal or the transformation of a fish into a mouse! In a linear man-made memory time is stored sequentially while in a MHV domain time is, in a way, randomly stacked, because MHV slices organise through pattern homologies independently from time coordinates.

For example a mushroom "A", stored in 1976, and an exceedingly close mushroom "B", stored in 1989, will be intertwined, stacked, very closely, independently of their respective time coordinates. This means that if the mushroom "A" appears into your oneiric consciousness it may very well be followed (through a simple MHV jump) by the mushroom "B". What is important to notice here is that each of these mushrooms is part of a larger MCV stored from exoreality. So if you are watching the mushroom "A" in an oneiric scene you may well be, in fact, in 1976 and when this mushroom connects to the mushroom "B" your consciousness could very well jump into the MCV associated with mushroom "B", meaning that you would all of a sudden jump from 1976 to 1989 via those mushrooms. MHVs are not always as simple as in this example...

Here is an example of motion MHV: in a train, in Tokyo, I look at the passenger door opening with a certain velocity. Suddenly the image of a crab opening its arms at the same subjective velocity of the door appears into my consciousness! What links the image of the door to the image of the crab is just a motion of similar speed... The apparent complexity of our thoughts can be reduced to basic MHVs connecting different MCVs. The more you observe your thoughts and the more you become keen to discover the links which connect apparently different thoughts.

Continuity and discontinuity of consciousness

The main characteristic of the dream and schizophrenic state of consciousness is discontinuity. When we are awake our consciousness is continuous and this is the reason why we can express ourselves in a verbally "logical" way. On the other hand the consciousness of the schizophrenic or the dreamer is made of continuous and discontinuous parts alternately. The nature of these discontinuities comes from the way our memory is organised and structured. Biological memories are not sequential memories: they store information both in a continuous and discontinuous way. Discontinuity comes from the fact that our memory classifies information through patterns. In fact, the brain has nothing to do with the computer analogy as a brain is, actually, a **pattern analyser** not a sequential analyser like computers. Computers will become intelligent only when they will work as artificial pattern analysers. As long as they will work sequentially they will continue to be complete imbeciles! In fact, as a scientist, I am amazed at how stupid computers can be. Another reason for their lack of any intelligence is that they cannot make mistakes and mistakes are the basis of emerging intelligence. Intersection memories, on the other hand, are very flexible.

Our memory thus stores information according to patterns. For instance spherical objects will be stored in the same memory area, triangular objects will be stored in their own memory area, etc. Our memory stores also information in a continuous way. This form of information storage is called MCV memory from "*mémoire à motifs continûment variants*". In fact, analysis seems to suggest that MCV memory is only an illusion and an expression of MHV memory where all stored patterns flow in the **same** time direction. So to each slice of MHV we can assign a time coordinate and when a set of slices of MHV have similar time coordinates then this produces continuity and the illusion of MCV memory. All this has been fascinating brainstorming and research for me, from 1976 to 1989! This is the first time I have shared some of my knowledge with many people.

An area which stores homologous patterns is called a *domaine d'homologie motifielle* in French, which may be translated as "homologous pattern domain". For instance, all the heads of people we have seen in our life are stored in a common homologous pattern domain which can be called, for convenience, a "pattern domain of heads": a MHV of heads! All those stored heads constitute a MHV of heads while one head is a slice, a section of this MHV, as we saw previously. This is important to keep in mind. But one head per se can also be subdivided into more "elementary" MHVs: so a slice of a MHV of heads, for instance, contains in itself other slices made of many mutually interacting MHVs. If we take one head (that is, one slice of a MHV of heads) and then introduce continuity by rotating this given head in the imaginary space-time of our memory we obtain a given MCV. A moving slice of MHV in time generates, radiates potential MHVs contained in its structure. This is reminiscent of fractals.

In the consciousness of normal people, those domains are always in a very low metabolic state. Thus, the patterns stored in these domains do not **radiate** outside. Metabolically inactive patterns, then, do not enter into consciousness, making our consciousness rather continuous. If the metabolic status of these domains is increased, then these domains start to radiate in all directions in our memory, introducing discontinuity, as our consciousness will start to flow according to pattern homologies. This can best be observed with the psychotropic cannabinoids, as cannabinoids, specifically, enhance the metabolism of homologous pattern domains thus giving rise to the typical discontinuous thoughts of a person intoxicated with cannabinoids. This, in fact, is the beginning of madness as pure madness will be characterised by a still higher metabolic activity in these domains. The thoughts of schizophrenics will thus be, essentially, discontinuous and this discontinuity will naturally put them in a state of total confusion as their consciousness will then become **illusioned**. The French psychiatrist, Dr. Joseph Moreau de Tours seems to have understood this phenomenon in his book "*Du Haschich et de l'Aliénation Mentale*", published in 1845 - one of the greatest ever books written on the mind.

The illusioned consciousness: towards an understanding of consciousness

When your consciousness is illusioned you can no longer recognise what you perceive from exoreality. To be properly conscious of an exogenous pattern, this specific pattern should be compared to its endogenous counterpart stored in our memory. If it is, erroneously, compared to a different pattern then our consciousness is illusioned: we are no more in moderation with the external (exogenous) reality. This is the essence of madness and of dreams where we are "conscious" (aware) of things which never existed in exoreality like false memories, etc. False memories generated in dreams are wrongly interpreted by non-scientists as "recollection" of "past lives"! When you can experience the illusionised state by yourself, at first hand, then you can understand how people can be convinced of the real "existence" of non-real events.

When homologous pattern domains are very active metabolically then proper recognition of exogenous patterns is disturbed and consciousness becomes "fragmented" because it, in fact, radiates in different stored homologous patterns. So, schizophrenia is a state of hypermnnesia. There is a limit to the quantity of homologous patterns which can be recalled per unit of time. When this limit is crossed, then we become crazy or we start, also, to dream! (This limit is called the *seuil d'illusion* in French). This means that no drug will ever be invented which could intensify our recalls indefinitely, as indefinite recall just generates consciousness radiation, which is confusion! Cannabinoids are memory enhancers but, under their influence, we remember so many things that we just forget them nearly as soon as we have remembered them!!! To the outside observer, this looks like amnesia but this is, actually, hypermnnesia. This physiological limit to proper conscious recall reminds us a bit of the problem of uncertainty discovered by Heisenberg. However, creative individuals, by continuously and nearly obsessively thinking of some ideas, enhance the metabolic status of the areas where their ideas are stored (these are hyper-complex MHVs) giving rise to a phenomenon of interaction/synthesis in homologous pattern domains. This interaction/synthesis is the **basis** of Creativity. So creative individuals learn to enhance the metabolic

activity of hyper-complex MHVs. Interaction/synthesis is a phenomenon which continuously goes on in MHV domains. This process continuously generates **order**.

Here is a simple example of interaction/synthesis. Let us take a MHV of mushrooms. Now let us take two sections (two slices) of this MHV like 2 particular mushrooms. It is **very important** to notice here that, most probably, these mushrooms **were not** stored at the same time. Maybe one would have been stored in September 1979 and the other one in October 1991. These 2 mushrooms can informationally interact and thus produce a **new hybrid** mushroom which was never observed in exoreality. This new mushroom will immediately be stored in the MHV of mushrooms. What is important to realise is that this hybridisation process is the basis of the Imaginary. Without interaction/synthesis in MHVs men would never have imagined anything **different** from what they perceive in exoreality. Myths, religions, all these things arose through interaction/synthesis in MHV domains.

So biological or artificial memories working by MHV storage inevitably give rise to an Imaginary. But what is more important to know, in our example, is that the new hybrid mushroom is a **time composite**.

Let us call our first 2 mushrooms A and B and the first hybrid produced C. Now that we have A, B and C nothing forbids new interactions/synthesis to proceed like, for instance, the merging of A and C to give D or the merging of B and C to give E. This can go on "forever": D might interact with A to give F, and so on. So an MHV becomes more and more complex, more and more **ordered** and structured with the passing of time. This is very important in understanding what "creativity" is. All these hybrids are spatial hybrids and time hybrids and this is why consciousness looks so free because it can go through all these "holes" linking different informational objects through a lot of MHV jumps. Consciousness itself can also become hybridised and give rise to bizarre thinking in dreams or madness. One example I have was the observation in a dream of little tadpoles which I interpreted, in my consciousness, as seedlings of bamboos!

Such a state of consciousness can be reasonably described by a phenomenon of partial modal recognition and absence of informational transfer. In the above dream I made a model which describes how visually perceived tadpoles can be "consciously" interpreted as tadpoles. The model also predicts the opposite case, for instance, in which the visual observation of bamboo seedlings could be evaluated by consciousness as being tadpoles! It took me about a year of thinking to discover this model.

Déjà Vu is the lowest state of Illusion

The phenomenon of déjà vu (already seen) is the best example of a phenomenon of illusion which everybody has experienced. Déjà vu and cannabinoid illusions are identical except for the intensity and time duration. In a déjà vu the brain superimposes two or more complex homologous patterns which are thus experienced simultaneously. This establishes a perceptive link between two different zones of the stored time continuum of memory. Déjà vu and more intense illusions are **philosophically** and scientifically exceedingly important phenomena because they demonstrate that consciousness arises when **homologous patterns are superimposed and thus compared**. The informational content of those

patterns **is not** what gives rise to consciousness but **only the comparison process in itself**. This is a major discovery which I realised in...1979! It explains a **lot** of things about the nature of consciousness and Reality.

So the **first step** in a CNS which gives rise to the phenomenon called "consciousness" is a process of superimposition of homologous patterns. This is why we can so easily have "full consciousness" of non-exogenous events during a dream or if we become crazy (*dérepixé*lisé, as I say in French!). Illusion is an extraordinary phenomenon which gives us the possibility of being conscious of practically **any non exogenously real event!** Because of this, many scientists studying "psychedelic" drugs have fallen into that trap to the point of believing in the exoreal nature of their illusions... This is understandable. Scientists are only humans and you need a lot of analytical power not to fall in the illusion trap as illusions are so nice and comfortable to believe, especially for atheists! Other illusions that anybody can experience are visual illusions based on artistic drawings. They obey the same rule as all illusions: superimposition of homologous patterns. Cannabinoids can induce pretty nice illusions as you mostly stay just under the threshold of illusion (*seuil d'illusion*). Experiencing one of these cannabinic illusions I discovered that consciousness was, primarily, a process of comparison of homologous patterns. In this instance, I was walking under *échafaudages* (scaffolding) in my home town of Genève when I suddenly experienced a very nice illusion as soon as I entered inside those *échafaudages*. I was transported into a similar experience, which I had lived before in Bângkoc, Siam! I could feel exactly like when I was under a homologous *échafaudage* in Bângkoc, "hearing" Thai people speaking and laughing, imagining the heat, the nearby river, etc, exactly as if I was just reliving the whole situation. Had I lost the idea that I was in Genève and **not** in Bângkoc I would have appeared, to an ignorant outside observer, just as any schizophrenic appears to their medical similarly ignorant environment...

When a Naked Woman becomes transformed into a Banana...

When a Blue Fish transforms into a blue Mouse...

And when all that starts a silent neuroscientific Revolution!

The MHV concept seems to have been first clearly discovered by myself around 1987, while I was in Japan, and when I woke up with a disattenuated image of a beautiful naked Japanese woman displayed in front of my eyes, just after oneiric cessation! An informational spoon was floating above her head and a man was firmly grabbing her sensual buttocks (I guess the spoon was there because, in my Unconscious now Conscious, lovemaking is often associated with eating sweet food, like "*un flanc à la crème*". I mean the image of a penis into a vagina often evokes, in my consciousness, the image of eating some kind of "*flanc à la crème*"! In fact, in many different cultures, lovemaking is associated with food eating in the minds of men)... Then the image of the man disappeared and I saw the buttocks of the woman opening (as shown in the drawing)! Inside each half "*fesses*" (buttocks!) I could see a... zipper (the English-speaking reader should be acquainted with the fact that the word "*fesses*", in French, is extremely exciting to pronounce and to hear: a lovely sensual word!). Then both zippers started to unzip, dividing each half-buttock again into 2 other halves. Suddenly the 4 halves moved and assembled together and, all of a sudden, this was replaced by a banana with 4 opened peels. With this observation I had my first incontrovertible observation of a MHV jump and I was delighted! It was an exhilarating discovery.

What is funny is that I made this observation while sleeping in the house of a Catholic priest, in Mousashi-Kosougi, near Tôkyô!!! If he had known what I had in mind... he might well have "ketobassed" me out of his place ("*ketobasu*" means, in Japanese, to kick, and it is a very amusing word for Japanese ears!)? My work on the mind has been much intertwined with love affairs with "*des femmes asiatiques*", Asian women, and I am happy that my discovery of MHVs was revealed in such a beautiful way: *les fesses d'une japonaise* (the buttocks of a Japanese woman!)... *Ouh là, là* . Scientific discovery through **buttocks**! I hope this will never disappear from textbooks in the future!!! The buttocks have always been one of my favourite sweets of women's anatomy. Men have achieved a lot of things in History in the name of buttocks! This is not well enough emphasised. Who knows now that, for instance, one of the greatest achievements of the British Empire was done because of a woman? It was for a woman that Pitt successfully destroyed New-France and French America!!! Each success he had against the French he would report to his wife in loving terms... like sweet presents for her so to show her that he was a real macho, someone to be admired and respected! Unfortunately, all that was made at the cost of blood, invasions, murders, and usurpations!

So, as I said, women's buttocks are essential in human History! At least, in my personal case, the end-result of my admiration for beautiful "*fesses*" is made at no cost at all: it is totally pacific and will be useful for all mankind! Another observation which perplexed me for perhaps two years before I solved it was an observation which I made in a dream (Hobson has it in Harvard, like the buttocks too...). In that conscious dream I was in front of a table and on the table was a blue fish. I seized the fish in my right hand and when I reopened my hand the fish had transformed into... a blue mouse with globulous fish eyes. I was extremely puzzled about how two dissimilar shapes could be connected as I was convinced that there was an underlying logical link between these two informational objects. Thinking obsessively about that only gave me headaches while I was attempting to make theoretical models to explain this transformation. And, one day, while I was walking through a market in Bôngkoc (Siam), with my great love Patanê Pongpatchamnânouète, I started to have a "fit of creativity"! Looking at all the fruits surrounding me I started to imagine them radiating, bubbling with MHVs. It was all beautiful. Suddenly, I saw in my mind the 3D image of a rotating fish and a rotating mouse which interpenetrated while in rotation. Then the rotation froze and here I could **clearly see** a common **intersection** between the fish shape and the mouse shape (see drawing)! At last I had found the underlying connection I was looking for, which was of course a peculiar MHV contained in both the fish shape and the mouse shape, as you can see in the illustration. That was a nice day but very soon my attention came back to my cherished Patanê who reminded me of some fruits in the market called "*mancoûtes*". The love of Patanê was essential in my work and creativity and love was very often totally intertwined. *Et c'est pour toi, notamment, ma Patanê chérie, que j'écris ces lignes. C'est mon cadeau car toutes les femmes aiment être fières de leur Amant! Je ne veux pas que l'Histoire oublie à quel point tu as été mon inspiration, comme Hiroé, Kazoué avant, Miyouqui. Je veux que l'on se rende compte que la créativité est intimement liée à la joie... et à l'absence de toute militarisation hiérarchique de la Science qui n'est que la fille naturelle de la Philosophie: la Philosophie Naturelle.*

Cannabinoid receptors, anandamide, illusion and schizophrenia

Illusion is the basic phenomenon involved in schizophrenia. Delta 9-THC is the main illusiogenic component of cannabis and an agonist at central cannabinoid receptors. This means that cannabinoid receptors could play a pivotal role in the induction of schizophrenia. The natural ligand of cannabinoid receptors, anandamide, is also an agonist at those receptors. Moreover, recently, it has been found that anandamide and Delta 9-THC decrease glutamate neurotransmission through a presynaptic mechanism. This could, conceivably, give rise to the same phenomena observed with typical NMDA receptors antagonists such as ketamine and phencyclidine, namely hallucinations and especially **illusions**. The action of anandamide on glutamate seems to be an ideal underlying phenomenon which could give rise to illusions such as those observed with cannabinoids and NMDA antagonists. Anandamidic neurotransmission should be disturbed in schizophrenics, especially in the hippocampus which is the link between real memory and its transfer to exoreality. In fact, as far as illusions are concerned, anandamidic disturbance should be the main primary cause of schizophrenia. Increased anandamidic function could decrease glutamate neurotransmission at NMDA receptors which, in turn, would increase metabolic activity through dopaminergic stimulation. Dopaminergic stimulation would then be the final end-result of anandamidic dysfunction, leading to both hallucinations and illusions through metabolic activation of memory zones.

Creativity is a process of spontaneous informational self-organisation

Memory is a "*structure informationnelle auto-organisatrice*", that is, a self-organising structure. This means that the content of memory spontaneously reorders itself to make more complex informational structures. This is done through the continuous interaction/synthesis phenomenon I just described, going on in the homologous pattern domains which, progressively, complexifies the information stored in biological memories. This is the very essence of creativity where new ideas suddenly visually appear when they are sufficiently self-organised. Biological memories constantly create **order**, through interaction/synthesis in homologous pattern domains. Then one level or order proceeds to a higher level, and so on. Cannabinoids can stimulate this natural phenomenon by enhancing the metabolism of memory areas. This does not mean that everyone can become creative with cannabinoids because, in order to be creative, you need to study and accumulate a lot of conflicting data in your memory and you need to be able to visually observe the progress of your memory in creating higher and higher order. Moreover, as we have seen, the hypermnesia induced by cannabinoids leads to spontaneous amnesia: ideas are forgotten nearly as soon as they are discovered because consciousness, under cannabinoids, **radiates** into a multitude of homologous pattern domains (these new ideas are visual in nature and one can learn to see his or her thoughts self-organising)! As for myself, I have learned to reason not only analytically but also non-sequentially, through the visual system, which always gives solution images to a particular problem I am trying to solve. The visual system solves problems by **approximations**.

The essence of creativity: the radiating consciousness

Creativity is like a diarrhoea: it comes by sudden episodes then fades away. Your mind starts to enter into a creative period only after a long period of "incubating" ideas by thinking to them over and over again, in

an obsessive way. This incubation is the result of two things:

1. Continuous accumulation of new information
2. Thinking obsessively about some peculiar problem you want to solve

The appearance of a creative episode is typically abrupt and often starts in the morning just after awakening from a dream in which you suddenly discovered a lot of complete or partial answers to the problem you are trying to solve! These answers are typically in the form of visual static or moving informational objects which describe the information you are looking for. You feel that your mind is very active, a bit like under dopaminergic stimulation. But, in fact, this state most closely resembles two other consciousness states:

1. The state of consciousness induced by cannabinoids
2. The state of consciousness induced by abrupt withdrawal of benzodiazepines

In fact the second state is very reminiscent of the first state but much weaker in intensity and not repetitive (no echo phenomena). Creativity always comes and fades away because it implies higher than normal metabolic activity in some of your memory zones, those zones activated by your scientific or philosophical obsessions! A typical episode lasts a day or a few days, no more. Your perception of reality is modified because your consciousness is in a radiating state, meaning that you become aware of a lot of MHVs simply by looking at exogenous objects. Suddenly everything becomes "meaningful" because your thoughts are radiating through MHVs. Watching a *paederia scandens* climbing around a stick of wood may just suddenly mean something to you until you find, after a few minutes, that the basic pattern of this climbing plant was identical to the pattern of the mosaic tobacco virus! This pattern homology forms the basis of this feeling of "meaningfulness". When your thoughts are radiating through MHVs everything becomes a bit magic as you can nearly see shapes and patterns anywhere you turn your eyes! People's faces become very interesting, as under hashish, as watching one face makes your thoughts radiate into homologous facial patterns. The whole world around you becomes like a living crystal as all forms tend to become fluid through MHV jumps. Everywhere there are "connections", links in the form of MHVs! The air around you seems fuzzy (*vaporeux, éthéré*) and anything you can imagine appears with clarity in front of your eyes in a slightly disattenuated way. The exogenous world seems to reach the extraordinariness found only in endoreality. Everything becomes interesting to watch at because your consciousness can "travel" in those memorised homologous patterns associated with your real time perception.

This state looks quite similar to the state of consciousness induced by the combination of a cannabinoid and a benzodiazepine. It is completely different from the state of consciousness induced by the reference serotonergic hallucinogen *psilocine*. For instance, as far as I am concerned, I never felt any illusion with *psilocine*. The old proverb saying that genius and madness are very close is well illustrated when you are knowledgeable about the state of consciousness induced by cannabinoids and when you can experience natural creativity episodes! As I said before, everything is a question of metabolic activation. If you increase MHV metabolism you start to become potentially creative and **more** conscious, more aware of a lot of things because you can **detect** all the pattern homologies between your thoughts and external

objects. But this is done at **a cost!** Time perception is altered and your lucidity is good only in **short intervals**. On longer intervals it might well give rise to confusion.

Cannabinoids seem to increase memory zone metabolism to the fringes of madness while NMDA receptors antagonists seem to increase this metabolism still to higher levels, kicking the consciousness of the subject into fullblown illusions! I have seen one person in my life going over the illusion threshold (*seuil d'illusion*) with cannabinoids... she was Japanese and she looked really schizophrenic for about 30 minutes. Authentic schizophrenics seem especially sensitive to the effects of cannabinoids. Anyhow it is clear for me that creativity and madness are very near indeed! The creative individual manages from time to time to have excursions just near the illusion threshold while the insane individual goes past this threshold never to return! *Capito?*

When two forms of drug-induced amnesia mutually cancel...

This explains why the combination of benzodiazepines and cannabinoids (two molecules inducing "amnesia") can lead to mutual suppression of their side-effects on memory, as benzodiazepines lower metabolism, meaning that they also diminish consciousness radiation. By adjusting the doses of a benzodiazepine (like clonazepam, for instance) and of a cannabinoid you can enhance your recall abilities without falling into pseudo-amnesia, and get interesting scientific or philosophical insights.

Introspective observation with cannabinoids gives you a good understanding of the dreaming, or schizophrenic, mind, as cannabinoids are, primarily, illusiogenic molecules. You do not get the same insight with hallucinogens as hallucinations, and illusions are completely different phenomena. An illusion is a state in which an exogenous pattern is not correctly identified, while a hallucination is a state in which you perceive something which just exists in your memory. In an hallucination your memory adds something to the exogenous perceived reality while in an illusion your memory wrongly identifies an exogenous pattern.

Illusions are fundamental in order to understand the oneiric and schizophrenic states of consciousness. The only well-known illusiogens have, until now, been the psychotropic cannabinoids. However NMDA receptors antagonists are clearly also illusiogenic and even much more illusiogenic than cannabinoids because they kick the normal waking state of consciousness into a strong state of illusions. Salvinorin, a diterpene hallucinogenic molecule from *Salvia divinorum*, may be also illusiogenic but I have not tested this molecule yet. Cannabinoids have a lot of properties different from the hallucinogens. For instance, they disrupt the speed of attenuation. This speed is decreased under cannabinoids and this phenomenon gives rise to the "time dilation" observed under these drugs. Under cannabinoids small sequences of time perception are continuously reiterated and superimposed on ongoing perception in real time.

Time perception is strongly modulated by serotonin. For instance, the specific serotonin re-uptake blockers, such as fluvoxamine or zimelidine, suppress the perception of time as thoughts are decreased in consciousness. The number of spontaneous thoughts per unit of time is essential in our subjective perception of time flow. When we have few thoughts per unit of time, then time flow seems slowed. On

the contrary, when we have a lot of thoughts per unit of time, then time flow seems augmented. So cannabinoids and serotonin reuptake blockers act on opposite direction as far as time perception is concerned. *Psilocine* is also extremely interesting because it seems to delocalise consciousness. With *psilocine*, for instance, you can, simultaneously focus your attention on different things going on and follow each of these things individually! To understand this phenomenon we should again go back to the basics of memory organisation: the MHVs.

Endoreality is like a coral!

In exoreality we all express only one person: ourself. In endoreality, however, we share a common imaginary space-time with other people who are stored representations of what we know about them. In fact these stored representations of others are in complete adequation with those others as perceived while awake. If I meet a friend in endoreality this friend is, in fact, totally similar to his image in exoreality, as long as I do not interfere with his behaviours... So our reality is only made of representations. Because of this fact, exoreality can be considered as oneiric-like in the same way as endoreality can be considered as exoreal-like. So exoreality and endoreality are a bit like **two mirrors** which constantly reflect upon one another. If you cut this mutual link, you are not studying reality anymore but only a fragment of reality...

This is the reason why all people disconnected from their endorealities are, in fact, situated in one fragment of reality, not reality in its entirety. So, people studying consciousness while not being **conscious** of their **own endoreality** are in error. They are busy with dream-like preoccupations, **not** reality...

Our memory is so quite similar to a coral where myriads of polyps inhabit the same domain. Each endoreal person, including yourself, can be compared to a polyp inhabiting this space: memory. So in our endoreality many people live together in a same imaginary (virtual) space-time. But to appear in this space-time the memory zones containing those people have, of course, to become metabolically active. Normally, we are "ourselves", during waking times, because only those memory zones responsible for the generation of our self are active. If other memory zones become active then we obtain the phenomenon of "multiple" personalities! When we dream a very small percentage of our memory is highly metabolically active. If everything was active, then dreaming would not mirror exoreality but be a space of total confusion! This is what seems to happen in the mind of those people who have experienced an ineffable mystic experience where their consciousness, apparently, radiates in many homologous patterns simultaneously, giving to the mystic this feeling that he can comprehend "everything" at the same time.

The discovery that memory is like a coral is a great thing because you discover that, in fact, you are **never** "alone"! Loneliness is only an illusion because of your inability to **contact** those other people stored in the coral of your memory... When you can **establish a contact** with those people, then it can solve a lot of problems you encounter in exoreality like, for instance, the exoreal loss of loved ones. If a loved person dies in exoreality he, first of all, dies for **himself** but continues to live in **all endorealities** of those people who stored his informational representation... Remember that our realities are made of only representations akin to oneiric informational objects. So, basically, they are **not real(!)** because a

representation can never accurately reproduce the objective object. The distortion between the representation and its object is so great that any representation can be then considered as oneiric-like, oneiric-mimetic.

If I am in love, for instance, in exoreality with Hiroé (my exoreal Japanese loved one) I am, in fact, in love only with a representation of Hiroé **which is not at all** the complete objective Hiroé... I am then in love with a complex 3D image similar to a complex 3D image of a dream... My Hiroé in exoreality and endoreality are **identical** for me, so meeting Hiroé in exoreality or endoreality is not so much different (as long as I do not interfere with her oneiric will)!

The serotonergic consciousness and time perception

The perception of time is highly dependent on *serotonine*. High serotonergic activity (not enhancing dopamine function or general metabolism) leads to a decrease of perception of time. Time perception can even disappear to be replaced by a feeling of "eternal present". This is due to the fact that *serotonine* increases attenuation. When attenuation is strong, it is no longer possible to sense the flowing of time because there are nearly no informational objects inside consciousness! Consciousness becomes thus detached and contemplative. Under fluvoxamine and zimelidine (serotonine reuptake-inhibitors) time can cease to be perceived: hours, months, or a journey in an airplane look all similar! Time flow is only felt after one stops using these molecules. Under zimelidine, for instance, you can very easily stay, say, sitting in front of a wall for hours without getting bored as you do not feel time flow! For an exogenous observer you may look deeply "reflective" and "thoughtful" precisely when you have **no** ideas in your mind! Very amusing from a philosophical standpoint.

A cat under 200mg of fluvoxamine will sit in any position (for instance paws behind the head!) you put him because he also has no more thoughts in his mind. Having no thoughts he "forgets", in this example, that you placed his paws behind his head and he will stay like this in a kind of serotonergic cataplexy! Very funny to observe for others... a friend of mine to whom I was joking about my cat under fluvoxamine (he did not know about that) would say: "*Eh bé? Je n'ai jamais vu un chat comme-ça*" (I have never seen a cat like this)! He would think that my cat was the most bizarre cat in the world, staying quietly with her paws behind her head!! Anything disturbing *serotonine* can lead to alterations in subjective time flow. For instance, if the speed of attenuation is decreased, as under cannabinoids, time seems to be very long because there are a lot of informational objects filling consciousness! Under cannabinoids there seems to be concomittant disturbances in both *serotonine* and GABA neurotransmission. How both neurotransmitters are exactly linked I still do not know. In fact time distortion under cannabinoids can be modulated, to a certain extent, by benzodiazepine receptors. Clonazepam is quite efficient in this respect.

As I am not a physicist I do not know what is really exoreal time (I wonder if physicists really know about that either!) but I certainly know that endoreal time depends on the quantity of informational objects flowing into consciousness per arbitrary unit of exoreal time!!! The more consciousness is filled with informational events, the more subjective time lengthens. The less consciousness is filled, the more

time comes to a halt giving a feeling of "no time" or "eternity", in subjective terms. *Psilocine's* alterations on time perception are still not well-understood by the author... give me time and I will find an explanation!

In summary the serotonergic consciousness is radically the opposite of the "cannabinoid" consciousness.

The dopaminergic consciousness and the essence of the male...

Dopamine is a neuromodulator which plays an opposite role as the role of serotonin. Dopamine enhances Action and stimulates self-confidence. It also stimulates aggression and the desire to demonstrate to other males (if you are unlucky to be a male!) that your "balls are bigger than theirs"!!! The anti-depressant amineptine is a good tool in order to investigate the effects of dopamine on behaviour. The normal dose range of dopamine for depression is 200mg a day. At 600mg/day, if you are a male, you start to feel an extreme sensation of self-confidence and the desire to show to other males "who you are"... meaning showing them that you have bigger balls than them! Maleness may then be related to a more dopaminergic mind while femaleness is, clearly, related to a more serotonergic mind. This reminds a bit the "yin yang" concept of the Chinese! Enhancing dopamine function sometimes lead to warmongering attitudes because your desire of aggression is enhanced whilst it is reduced substantially under serotonin. So dopamine may be partly responsible for enhancing aggression but dopamine and serotonin are intimately linked in the CNS. Enhancing serotonin neurotransmission most often decreases dopamine neurotransmission and vice-versa. Of course this is a simplified scheme as the brain, when it comes to any single behaviour, is extraordinarily complex and redundant. For example, such a "simple" action as the control of penis erection involves at least more than 10 different receptors and many neurotransmitters or neuromodulators!

We have no "free will": everything we think reflects the biochemistry of our nervous system

The concept of human free will is a Christian legacy which is no longer in adequation with scientific knowledge. Introspective psychopharmacology and the study of different states of consciousness clearly demonstrate that what we think, what we do, or what we say is merely a reflection of the particular biochemistry going on, at a certain time, in our central nervous system (CNS). This is why, for instance, mankind is so irrational.

Experiments of mine have shown that by slightly modifying brain neurochemistry we can think in completely opposing ways and argue, for instance, with pseudo-logical arguments to justify this brain neurochemistry unconsciously. For instance if I modify my brain biochemistry in a more dopaminergic way, or more serotonergic way or if I experiment with a sociabilising molecule such as [gamma-hydroxybutyrate](#) or even ingest female hormones, then I will see very clearly in myself how my thoughts only reflect my CNS biochemistry. This can be quite spectacular sometimes as you may find yourself

arguing "logically" in opposing ways, depending on the induced biochemical modifications!

For a psychopharmacologist there is no such thing as "free will", etc. This belief is only a prejudiced judeochristian cultural belief and a delusion. There are only states of consciousness expressing a particular CNS biochemistry. This is an extremely important scientific and philosophical observation as it teaches us that any human discourse is always **suspect** as someone will always just express, **verbally, his particular CNS biochemistry**.

When you become aware of this crucial fact you no longer feel an urgency to communicate with others in a pseudo "communication", as words are merely a way of altering the brain neurochemistry of someone else so he may share the same delusions as yours! Words are thus similar to psychotropic drugs and such words as "love" or "hate", "freedom", etc, are particularly hallucinogenic. Politicians are experts in using hallucinogenic words in order to manipulate the mental states of others. So are playboys with their victims!

All great dictators, such as Hitler, etc, have always been very keen at manipulating the biochemistry of others through word-induced emotional hallucinations, which are called corticolimbic hallucinations. These hallucinations are far worse than cortical hallucinations induced by molecules like *psilocine* or other "hallucinogens". Corticolimbic hallucinations mostly go unrecognised in nature as people are not aware that they are, very often, hallucinating corticolimbically. This is why I also call these everyday hallucinations "unidentified hallucinations". These hallucinations are the most dangerous forms of hallucination for the human species and have been and are at the root of man's aggressive and violent behaviour intra-specifically. All wars, all conflicts start with corticolimbic hallucinations. . .

A human being **can never** have perfect objectivity, and the examples in Science are numerous: to discourage us from trying to attain an authentic objectivity, as scientists, like everybody, mostly express their own frustrations or delusions in their discourses. Science **is not** objective even though it tries to reach objectivity. Science is the expression of the human mind and we can conceive that very advanced intelligences could be completely at odds with what we believe they should do as their "science" will also reflect the organisation of their "central nervous system" or equivalent.

Human communication is highly primitive

Man is still a primitive species as his symbolic sequential means of "communication" has a very low flux of "bits per second" and because such a language has a huge signal to noise ratio. Human "communication" is embedded in noise and thus the level of distortion between 2 communicating persons is always very high. This is the basic reason why human beings become so frustrated with "communicating"...

It is very probable that advanced intelligences no longer use symbolic sequential communication but, instead, non-symbolic non-sequential communication as this form of communication is extremely accurate and fast. I guess that in the future the human species will modify its the function of the CNS

through a new science, yet to be born, called **neuromorphogenetics**. With this knowledge we will create *de novo* new communicating structures capable of transmitting and receiving non-symbolic non-sequential information. This will create a big gap between the present-day homo sapiens and the new homo yet to be born. In fact, a lot of reflection on this topic leads me to think that there are levels of intelligence and that the superior level has no logical interest even in trying to "communicate" with the lower levels.

This is why I believe people like Carl Sagan, etc, who replaced the quest for God by the quest of extraterrestrial intelligences (ETI) are, unconsciously, deluding themselves in the desperate search for a meaning and transcendence of life. I firmly believe that there **will never** be any form of "communication" between homo sapiens and ETI.

Homo sapiens, for instance, does not communicate with mice because they are separated by a big gap in intelligence. Likewise, ETI capable of reaching our planet will certainly not waste their time with such a primitive species as homo sapiens. Very probably ETI capable of reaching Earth would already use a non-symbolic non-sequential means of communication, the result of this being non-communication between the two species! Another thing which would certainly fundamentally separate ETI from us is that they should have learned not to age as ageing and death are the most fundamental problem for any intelligence.

When homo sapiens has given rise to a new more advanced homo (and probably immortal, as death is a kind of genetic disease which must be repaired) he will soon fade away and I feel this may happen quite fast, maybe just in a millenium. It is science-fiction to think that homo sapiens will remain the same in a near future. Homo sapiens are doomed to disappear rapidly and give rise to more advanced beings. In a way the real human, as I conceive it, still does not exist as homo sapiens still share a lot in common with animals.

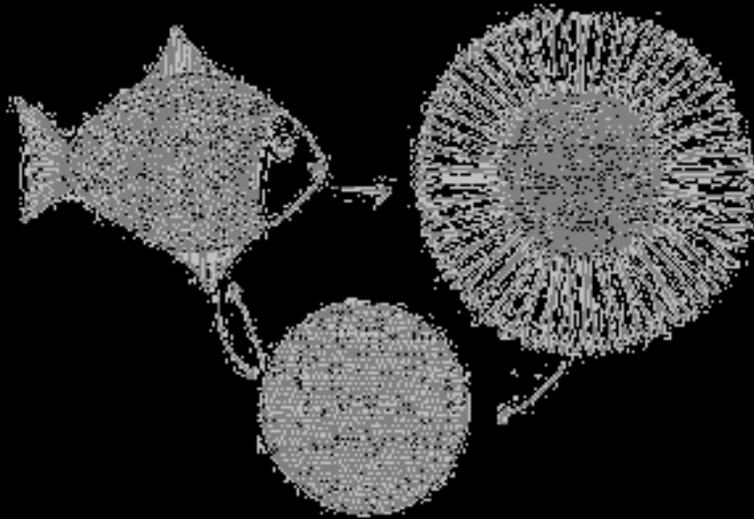
One day there will be real humans but we **are not** yet those humans. We are pre-humans, still very bestial and doomed to a grotesque destiny because of senescence.

What is consciousness?

The study of dreams and schizophrenia demonstrates that consciousness, as a whole, is the summation of small amounts of consciousness.

Consciousness is, basically, a process involving pattern recognition. Pattern recognition does not automatically lead to objective consciousness as we can be (in dreams or in schizophrenia) conscious of non-existent "memories". In dreams or schizophrenia **we can be conscious of things which never existed** in exoreality. Why? Because our consciousness is illusioned, as can happen under high doses of cannabinoids. To be conscious of false memories is a highly exciting experience which opens you up to a quasi-infinite number of subjective imaginary experiences!

To develop all this here is time-consuming and needs some drawings!



In this observation I first saw a fish which looked like the one drawn here. It looked a bit like a bizarre "*baliste*" (trigger fish?). The disattenuated image of the fish was a bit coloured with orange hues, like an object you see in darkness faintly lighted by the setting sun. This observation occurred when I was quite stressed, one night in Bângkoc, Siam, as I guess stress can increase the metabolism of memory zones so giving rise to slight or strong disattenuations. The stress was due to the fact that my girlfriend Juliette Bourdat (a quite sweet extraordinary French-Vietnamese who helped me a lot in my work) was in a depressive mood that night and that I felt unable to help her. So as my stress rose I started to observe a lot of disattenuated images while in our bed, listening to the songs of Siamese toads singing, outside in the night! This night I observed a lot of "*transformations motifielles*"; even a very interesting animated one in which I could see the back of a running horse (buttocks, tail and legs) transforming, in animation, into the back of a similarly positioned running man and so on, in a repetitive cycle (Hobson has this drawing! After he saw some of my drawings he sent me similar drawings done by a 19th century French artist called Grandville). What was specific in that observation was, again, the homologueous pattern of the buttocks and legs with the addition of the frequency of the moving legs. Visual thoughts can also be linked by a homologueous movement, like the frequency associated to a moving object... For instance, moving my head in a certain way I suddenly see the image of Arnold Schwarzenegger moving in the same way! If scientists had proceeded to study the CNS through the **scientific study of disattenuations** they could have easily discovered a lot of things which are very difficult to study just by external observation. Unfortunately most of them are very stubborn to novel ideas and will act in the same way as those stupid priests who refused to look through Galileo's telescope at the satellites of Jupiter or the spots on the sun because, they said, "the sun could not have anything altering its purity"... This kind of stubbornness (which I ironically call "*le syndrome testiculaire*" (the testicular syndrome) is a typical male "dopaminergic" behaviour which Pierre Boule has magnificently illustrated in his famous book "*La Planète des Singes*" (The Planet of the Apes). In Pierre Boule's book the hero (who is French, by the way, and **not** American!) of the story, who is depicted by Charlton Heston in the US film, is named in a very interesting name: Ulysse Mérou. A "*mérou*" is a kind of very big fish living in the Mediterranean sea and supposed to be quite smart! I think this name was not chosen at random, neither the first name "Ulysse" (Ulysses, in English). Ulysse Mérou's intelligence (like the mérou) would be in sharp contrast with the stubborn and stupid "scientists" depicted by Boule as talking orang-outans... The US film depicted quite well the primitiveness of the "orang-outan" scientists who form the vast majority of the "common" kind of "scientists" in reality! For me they are the perfect illustration of the vast majority of so-called scientists you find in Universities, etc. They are struggling like baboons to establish their pecking order and **dominance**, as my late friend, Dr Henri

Laborit, has demonstrated. They sterilise the imagination and enthusiasm of authentic creative scientists who have nothing to do with competition, ego and dominance. So if you are imaginative or creative you do not have much choice left in front of these orang-outans afflicted with their "testicular syndrome", something typical of males! But enough digression. Bon! Let us come back to this illustrated fish! So the fish suddenly disappeared to be transformed into a sunflower! Then the sunflower became transformed into "*les alvéoles d'une ruche d'abeille*" (a honeycomb). Afterwards the image shifted back to the "baliste" fish, in an oscillating movement. So what linked all these images was a roughly homologous pattern: the reiterative fish scales, the reiterative interior of the sunflower and the reiterated bees' "alveoles".

Suffice to say that when an exoreal pattern is compared (in our memory) with its corresponding endoreal pattern we become conscious of things which really exist in exoreality. But when an exoreal pattern is compared to a slightly modified endoreal pattern then we become conscious of non-existent things. This is the basis of most dream or madness experiences.

What regulates this proper or improper pattern recognition is the **metabolic state** of memory areas involved in specific pattern recognition. A high metabolic rate in homologous pattern domains will give rise to erroneous pattern recognition as homologous pattern domains start to radiate in the imaginary space-time of memory.

Consciousness is a story of pattern recognition and metabolism. This is why consciousness is strongly modified by drugs enhancing or diminishing brain metabolism in memory areas. For instance, the specific serotonin-reuptake blockers decrease metabolism and thus consciousness becomes empty, lethargic, while enhancing dopamine neurotransmission leads to enhanced metabolism and thus enhanced consciousness. Serotonin is, mostly (keeping apart the story of 5-HT_{2A} receptors!), the molecule of tranquility, placidity. It makes us unreactive to events, such as stress, sexual desire, etc. Serotonin decreases all baseline behaviours. Dopamine, on the contrary, is an ubiquitous metabolic activator and it stimulates activity, confidence, clarity of consciousness (up to the frontier of illusion where, consciousness, starts to radiate and thus becomes "confused"!). Overconsciousness is thus equal to apparent confusion for an external observer, as demonstrated with experiments involving cannabinoids and benzodiazepines. Things are very clearly recalled but almost instantaneously forgotten because of consciousness radiation.

When does consciousness arise?

Consciousness arises when exoreal and stored endoreal patterns are compared. The informational content *per se* of these patterns is **not** as important as the **comparison** process itself. If the comparison process is successful, then "consciousness" arises **independently** of the objectivity of informational content. This is the reason why we can be conscious of things which never existed in the exoreality. I became clearly aware of this process around 1979 and I refer the reader to my articles for more information.

Consciousness is nothing more than a metabolic activity in a memory area!

When informational objects are metabolically inactive, by definition they are **unconscious**. At any

moment our memory contains billions of informational objects which are metabolically inactive or in a very low metabolic state. This is why we are **not conscious** of their existence. Any informational object starts to **exist** for us when the metabolism of the memory area where this object is stored is increased. When the increase of metabolism of this object reaches a critical intensity then we, all of a sudden, become **conscious** of its existence. We have already seen that we can be conscious of any simple informational object (like the image of a person, for instance) or be conscious of complex informational objects consisting of subunits and displaying a length of time of existence: for example, the vision of a whole non-existent situation, like in dreams or schizophrenia.

From what we already know we can make the following summary:

1. When an informational object is metabolically inactive, it does not exist for us.
2. When an informational object reaches a critical metabolic intensity then it becomes conscious.
3. When an informational object becomes metabolically very active, to the point of the illusion level, then it starts to **radiate** in many homologous pattern domains (MHVs).

Consciousness thus becomes spread through all these MHVs and we are thus conscious of a lot of things simultaneously. But this gain in consciousness is made at a cost: the cost of time. In such a state we can be conscious, simultaneously, of a lot of informational objects but for a very short time. This brings to mind Heisenberg's dilemma!

In our normal waking state of consciousness we can be conscious of a few things only but for an extended period of time. In a radiating state of consciousness we can be conscious of a lot of things but for a very short time only. We saw before how we could modulate consciousness radiation through cannabinoids and benzodiazepines. But the fact to be **remembered** here is that consciousness is nothing other than a metabolic activation of a memory area! Consciousness then becomes easily understandable and is not mysterious any more! In particular we no longer need to introduce crazy mystical ideas or crazy ideas arising from quantum mechanics (!) in order to understand what consciousness is! The study of consciousness is a problem of informational neurobiology. It has nothing whatsoever to do with religion or physics.

La Conscience est un phénomène de Résonance motifielle

Introduction

Je pense avoir découvert, après 21 ans de recherche intensive, ce qu'est la conscience. Cette découverte est aussi belle, conceptuellement simple, mécaniste et lumineuse de clarté, que le célèbre $E=mc^2$ d'Einstein! La résolution théorique de ce problème s'est produite le 26 mai de cette année mil neuf cents nonante sept, au sortir d'un rêve, comme d'accoutumé, dans le raisonnement par "arborescence" et "ramification" que j'utilise pour cerner un problème. Le raisonnement arborescent est d'une redoutable efficacité pour s'approcher, toujours plus près, d'un problème réputé insoluble car il enserre le problème dans une maille de ramifications de plus en plus dense jusqu'au moment où le problème "déclare

forfait"!!! Ce 26 Mai le problème que je me posais sur la conscience depuis tant d'années a déclaré "forfait" et j'en suis bien aise! Si ce raisonnement devenait courant en sciences et en recherches philosophiques, eh bien nous ferions, dès lors, des percées rapides dans tous les domaines, depuis l'étude des hyper-cordes en physique jusqu'à la création de la neuromorphogénétique générale, science à naître et dont je suis "l'imaginaire", le concepteur si je puis dire.

Passivité de la perception perceptive

Quand le cortex de notre système nerveux est dans un état de perception inconsciente cela signifie qu'il se contente de recevoir de l'information des détecteurs sensoriels, sans aucune rétroaction sur ladite information. Un tel état de réception passive peut être expérimenté, par le chercheur, au moyen de certains inhibiteurs spécifiques de la sérotonine. En résumé: le cortex est dans un pur état perceptif seulement lorsqu'il se contente de recevoir de l'information des détecteurs sensoriels. Cela rappelle l'image du miroir parabolique se contentant de refléter le paysage.

Naissance de la Conscience

Pour qu'il naisse une "conscience" dans un "point" du système nerveux il faut que ce point soit activé par un système, le SAC, qui hypermétabolise ledit "point". Le SAC c'est le Système Activateur de la Conscience, système prenant son origine dans la formation réticulaire et se ramifiant, en arborescences, dans tout le système nerveux, depuis le système limbique au cortex. Le SAC est donc un système diffus, arborescent ramifié dont la fonction est de modifier le métabolisme d'une zone focale sur lequel il se projette à un instant donné. Quand quelque chose "d'intéressant" apparaît, par exemple, dans le champ visuel il intensifie le métabolisme associé à cet évènement "intéressant".

Le SAC induit une augmentation de connectivité par élévation métabolique en un point focal.

L'élévation métabolique, engendrée par le SAC en un "point" du système nerveux (le SAC est un intensificateur/réducteur métabolique) a pour conséquence de provoquer une augmentation de connectivité, par rayonnance motifielle, dans ce "point".

Le seuil métabolique de la conscience

Quand un seuil métabolique est atteint (appelons ce seuil: le Seuil de la Conscience) la rayonnance motifielle déclenche alors l'apparition d'un "système mémoriel résonant" c'est à dire un système dont un motif A et un co-motif B se répondent, en résonance. C'est cette résonance qui induit la continuité perceptive car elle entretient la perception dans une boucle informationnelle fermée.

Définition mécaniste de la Conscience:

La Conscience c'est l'ensemble d'un système de résonance entre deux régions mémoires où, plus précisément, entre deux domaines d'homologies motifielles.

Elle commence quand une perception devient entretenue, par un mouvement de va et vient (c'est à dire la résonance ici définie), entre deux régions mémoires. Je suis ainsi conscient d'une tranche de M.H.V, par exemple, lorsqu'il existe une boucle fermée, résonante, de circulation informationnelle dans ce MHV.

Etre "conscient" c'est la sensation subjective que nous éprouvons lorsqu'un tel phénomène de résonance se produit! Point à la ligne. Il est inutile de chercher plus loin car tout se trouve dans cet énoncé qu paraît si banal...

La première image qui saute aux yeux, pour donner une visualisation symbolique de ce phénomène, c'est le rayon de lumière laser qui se reflète, en un va et vient, entre deux miroirs. La conscience d'un motif c'est un peu comme cette analogie: elle n'existe que tant que le rayon de lumière se reflète incessamment entre les deux miroirs.

Le SAC sert à créer des systèmes de résonance

Le SAC est essentiel dans le processus d'initiation de la conscience, bien qu'il ne fasse pas partie du phénomène conscient lui-même! Le SAC crée des systèmes résonants. Cette création de systèmes résonants, sur un intervalle de temps, c'est la "conscience" sur un intervalle de temps! Il crée ces systèmes mémoriels résonants en élevant le métabolisme local des zones où il focalise son activité, ce qui a pour conséquences:

1. D'augmenter la connectivité entre zones mémorielles
2. D'intensifier la rayonnance motifielle
3. Tout cela aboutissant à la création, en une zone mémoire donnée, d'un système résonant.

Sans le SAC, les zones mémorielles du système nerveux ne peuvent pas être suffisamment activées métaboliquement pour lancer des résonances, sauf, peut-être, dans certaines psychopathologies. C'est pourquoi la formation réticulaire, d'où provient le SAC, est essentielle dans le phénomène de l'induction d'une "zone consciente", dans l'espace global de la mémoire. Par contre, dans diverses pathologies, conduisant à une élévation métabolique dans les zones mémoires du SNC, il se produit alors des phénomènes de "conscience" sans doute sans participation directe du SAC. Pas encore clair. Un phénomène de conscience très intéressant est celui qui apparaît chez certains patients ayant "approché" la mort de près. Dans ces cas là, la conscience naît, logiquement, en réponse à une activation métabolique transitoire générée par une antagonisation des récepteurs glutamaergiques que l'on nomme les récepteurs au NMDA, projetant le patient dans un simple rêve conscient, rêve, néanmoins, stéréotypé en raison de causes encore à rechercher.

Le SAC dans les rêves ordinaires et les rêves conscients

Le fonctionnement du SAC dans différents états de conscience devrait, théoriquement, ressembler à quelque chose comme ce qui suit:

1. **Éveil:** activation du SAC qui focalise alors sur des zones mémoires et intensifie leur métabolisme jusqu'au seuil de la résonance motifielle d'où "conscience".
2. **Rêve ordinaire:** le SAC est inactif. Donc il ne peut pas générer une conscience de type continue comme durant l'éveil.
3. Cependant, en raison de la cessation du fonctionnement de l'atténuateur, tout le cortex cérébral, etc, se trouve à un niveau métabolique plus élevé qu'à l'éveil et en-delà du seuil d'illusion. Ceci a pour conséquence d'engendrer des résonances spontanées, métastables, qui donnent alors autant de "consciences" illusionnées respectives.
4. **Rêve conscient:** le SAC redeviendrait actif mais se mettrait à fonctionner de façon inverse qu'à l'éveil, hypométabolisant des zones mémoires normalement actives, à un certain niveau basal, à l'éveil. Cette diminution du métabolisme dans ces zones ferait retrouver au sujet toute sa conscience normale de l'éveil.

Dans ce schéma théorique le SAC se comporterait comme un intensificateur focal métabolique à l'éveil et comme un réducteur focal métabolique dans le rêve conscient. Le système sérotoninergique ascendant est, sans l'ombre d'un doute, la composante réductrice du métabolisme. Dans ce cas on devrait mettre en évidence, lors du rêve conscient, une réactivation du système sérotoninergique normalement au repos dans le rêve ordinaire. Par ailleurs, les récepteurs 5-HT_{2A} pourraient jouer un rôle fondamental dans la modulation de la conscience. Par exemple, la stimulation des récepteurs 5-HT_{2A} est responsable de l'intensification du métabolisme élicite par la psilocine et autres cogitatio-gènes dans le cortex frontal. Le système noradrénergique pourrait être une des composantes des systèmes intensificateurs du SAC, en concomitance avec une médiation glutamaergique. Mais, bien sûr, les choses doivent être peu plus compliquées que ces esquisses d'hypothèses! Il reste, néanmoins, que le système sérotoninergique peut aussi bien diminuer un métabolisme général que l'activer (par exemple au moyen des récepteurs 5-HT_{2A} qui doivent jouer un rôle important durant le rêve soit à travers la sérotonine soit, hypothétiquement, à travers la diméthyltryptamine endogène). Le SAC est, en fait, synonyme avec mon concept du Dérepixélisateur ou D.R.P. Par contre, le fonctionnement de ce DRP, réexaminé, serait un peu différent de ce qui était envisagé dans mes réflexions précédentes. C'est ainsi que progresse le raisonnement arborescent ramifiant!

Phénomène de la conscience en bascule

C'est un très joli phénomène qui démontre que la conscience n'est que la sensation subjective que nous avons (comme dans le cas des couleurs que nous voyons mais qui n'existent pas exogènement!) de phénomènes de résonances entre zones mémorielles! Prenons l'exemple amusant mais fondamental d'une "illusion", la fameuse illusion de motifs imbriqués où nous percevons tantôt la tête de Freud tantôt des femmes nues et lascives! Analyse du phénomène de bascule: Cet exemple nous montre, très clairement, ce qu'est la conscience, eh oui! Dans cette tête de Freud on distingue, pour simplifier, 2 motifs de base:

1. La tête de Freud
2. Une femme toute nue

Ce qui est intéressant c'est que pour la plupart des gens lorsqu'ils mettent leurs yeux en face de ces 2 motifs imbriqués ils ne sont **conscients**, en fait, que d'un motif à la fois... Bien que leurs yeux voient l'ensemble des 2 motifs leur "conscience" est aveugle (comme dans un rêve) car elle ne peut "voir" qu'un motif à la fois! Ce phénomène d'aveuglement de la "conscience" est fondamental car il nous démontre, ipso facto, que la conscience **naît** et **n'existe** que lorsqu'un exomotif détecté est comparé à un même endomotif homologue, en un système résonant. Que cela signifie t'il en termes sous-jacents? Cela signifie que lorsque l'on voit la tête de Freud, seulement, dans la tête de Freud (contenant aussi la femme nue) on ne devient **conscient** qu'au moment où apparaît une **résonance** entretenue entre l'exomotif et l'endomotif homologue correspondant! Etre "conscient" de la tête de Freud c'est en fait l'interprétation subjective (comme le fait de voir des couleurs) que nous avons du phénomène de va et vient d'information homologue dans un système résonant. La conscience c'est la résonance, un peu comme deux miroirs se reflétant, réciproquement, un rayon de lumière! Tant que la lumière (ici l'information) "résonne" entre les deux miroirs (les deux motifs) il y a conscience. Quand la résonance s'amenuise, la conscience baisse. Quand elle s'éteint il n'y a plus conscience: je ne vois plus, par exemple, la tête de Freud bien qu'elle soit en face de mes yeux, comme dans un rêve ou un état de délire!!! Cela se produit par un phénomène de bascule c'est à dire que, tout à coup, la résonance se déplace vers une autre zone mémoire, celle de la femme nue et je deviens alors **conscient** de l'existence de la femme nue tout en redevenant **inconscient** de la tête de Freud, bien qu'elle soit sous mes yeux... C'est hyper-fondamental tout cela.

La Conscience illusionnée

Dans la conscience illusionnée il y a un glissement de la résonance et établissement d'un système résonnant entre un motif donné A et un autre motif endogène B qui ne lui est pas parfaitement homologue. Qu'importe! La conscience naît quand même puisqu'elle se trouve dans le système résonant **seulement** et pas dans l'adéquation ou l'inadéquation de la résonance! C'est ainsi que l'on est "conscient" de choses fausses, comme dans le rêve ou la folie! Splendide! La conscience, donc, c'est la sensation subjective d'un système résonant tel que décrit ci-dessus. Rien de plus, rien de moins (On peut rapprocher cela de la vision des couleurs. Qu'est-ce qu'une couleur? C'est la sensation subjective d'un phénomène de calcul opéré par trois détecteurs/analyseurs/intégrateurs)! C'est pourquoi l'on peut être conscient de choses parfaitement imaginaires et n'ayant aucune correspondance dans l'exoréalité, phénomène d'une importance psychopharmacophilosophique extrême car l'implication de cela c'est qu'être conscient ne veut pas dire, ipso facto, être en contact avec une réalité objective... Etre conscient n'est qu'un phénomène purement mécanique qui n'aboutit pas, nécessairement, à la réalité objective. C'est un phénomène du même ordre que la vision des couleurs qui, en dehors de nos crânes, n'existent pas bien qu'elles existent pour chacun de nous, à l'évidence!

Le Seuil d'illusion et les chemins d'illusion

Le seuil d'illusion est un concept fondamental car il indique le pourquoi du comment de différents états de conscience. L'intensité de la conscience dépend de:

1. Temps de la résonance entre motifs
2. De l'énergie métabolique résonante

Plus l'énergie métabolique augmente, dans un système de conscience résonant, plus cela a tendance à activer d'autres systèmes résonants colocalisés, car très proches motifiquement. La résonance a alors tendance à circuler, à se déplacer dans la mémoire, au lieu de rester dans un point fixe. Cette résonance se déplace de façon "transverse" sur les diagrammes théoriques c'est à dire dans des domaines d'homologies motifielles.

Quand la résonance se déplace on a alors une conscience d'abord rayonnante puis illusionnée, une fois franchi le seuil métabolique du seuil d'illusion.

Au delà d'un certain seuil de déplacement de la résonance les liens entre les différents systèmes résonants deviennent de plus en plus disjoints et la conscience se "fragmente" donc, comme sous haschich, c'est à dire qu'elle rayonne intensément.

Quand l'énergie métabolique dans une zone mémoire est égale ou plus grande que le seuil d'illusion les systèmes mémoriels résonnent, alors, de façon *eacute;tendue, introduisant, dès lors, une distorsion totale de la conscience par rapport à la perception: La conscience est illusionnée car elle n'est plus en relation biunivoque avec la perception.

Par exemple le couple des zones résonantes A et B qui entraînent une conscience correcte de l'exomotif A se brise pour laisser place à un nouveau couple résonant de A et C (C étant un motif proche de B). La nouvelle raisonance entre A et C est une conscience illusionnée! Et voilà!

En illustrant ceci imaginons les motifs en question:

- Soit A l'exomotif du visage de Patanê
- Soit B l'endomotif homologue du visage de Patanê
- Soit C l'endomotif du visage de Christine, endomotif motifiquement très proche du motif A.

Etre conscient de Patanê, là, en face de mes yeux c'est le résultat du couple résonant A et B. Si, par contre, le couple résonant devient le couple A et C alors (bien que je vois tout à fait et fort exactement le visage de Patanê avec mes yeux!) je perds la conscience de Patanê pour devenir conscient du visage de Christine, stocké dans ma mémoire et activé par la résonance motifielle entre le couple A et C. Et revoilà!

Les cannabinoïdes psychotropes ainsi que les antagonistes des récepteurs au NMDA ont la propriété d'orienter la conscience vers des chemins d'illusion de plus en plus intenses. Un chemin d'illusion c'est le domaine de la conscience qui se situe au-delà du seuil d'illusion. C'est le domaine de la conscience des fous et de l'homme qui rêve, chaque nuit!

Le sens

Qu'est-ce que le sentiment subjectif du "sens"? Par exemple, je contemple une plante-chou (paederia

scandens ou hécosocazoura, en japonais) et je ressens qu'elle recèle un sens! Cela me devient clair lorsque, subitement, je deviens conscient de l'image (et de tout ce qui s'y rapporte) du virus de la mosaïque du tabac, virus que j'ai bien étudié, autrefois! Le sens d'un objet perçu c'est la sensation subjective provenant de l'établissement d'une liaison informationnelle entre deux objets informationnels possédant une commune homologie motifielle. Dans le cas ci-dessus l'homologie motifielle était le brin d'ARN du virus de la mosaïque de tabac résonant avec la tige grimpante, enroulée en spirale, de la plante-chou. La plante-chou prend, soudain, un sens parce qu'elle est connectée, motifiellement, à l'image d'un objet que j'ai bien étudié et que je connais donc bien. Un autre exemple: je suis en face d'un pin noir d'Autriche, à Genève, sous influence cannabinique. Regardant ce pin il me devient spontanément signifiant. Je ressens qu'il signifie quelque chose mais je ne sais pas encore quoi. Regardant les aiguilles rayonnantes du pin quelque chose me dit que cela a quelque chose à voir avec la conscience. Des années plus tard je découvrirai le concept des MHV et de la rayonnance motifielle et je réalise alors que les aiguilles et les branches du pin avaient un sens parce qu'elles se rapportaient à ma pensée en train de naître à ce sujet! Encore un autre exemple (dont je n'ai pas la solution mais elle finira bien pas surgir, sans faire aucun effort conscient!) c'est le sens que j'attribue à la vision d'un cèdre qui me fait penser à une cellule pyramidale! Le tronc s'identifiant à l'axone, les aiguilles s'identifiant aux épines dendritiques, les branches aux dendrites. Je vois ce cèdre et je ressens que la solution du problème non-résolu concernant le lieu matériel de la mémoire et de son établissement se trouve là! Sur les aiguilles (les épines dendritiques, donc!) j'imagine des connections sérotoninergiques et dopaminergiques agissant de concert pour faire varier des paramètres, encore inconnus, agissant au niveau de ces épines dendritiques. Toute la pensée créative fonctionne de cette façon, à travers la vision et le sens subit de quelque chose.

Réinterprétation du concept des pixels

En 1979, j'avais défini le pixel comme un élément d'information absent de la tissûre (tissûre est un mot du vieux français) de la conscience onirique. Si nous reprenons l'exemple simple de la tête de Freud avec une femme nue dedans on peut dire que cette tête contient deux pixels imbriqués. La conscience n'est, normalement, capable de percevoir que l'un ou l'autre des pixels alternativement, par un phénomène de bascule qui engendre une résonance A ou B mais pas les deux simultanément. Le passage de la résonance A à la résonance B est la conscience de A puis de B. Chaque bascule d'un pixel à un autre fait perdre un élément de conscience, c'est à dire qu'une résonance en supprime une autre. Ainsi quand je passe du pixel "tête de Freud" au pixel "femme nue lascive" je perds la conscience de Freud bien que mes yeux voient le Freud en question (ce qui veut dire que le pixel contenant le motif de la tête de Freud est **absent** de ma conscience, comme dans n'importe quel rêve). Chez le fou (et dans le rêve ordinaire!) les mêmes évènements se produisent mais à une échelle plus grande dans le champ perceptif: par exemple (comme dans une illusion cannabinique) c'est tout le champ de perception visuel qui peut basculer d'un macro-pixel à un autre macro-pixel, comme par exemple passer de Genève à Bângkoc en passant sous des échaffaudages liés dans un même MHV! Ces macro-pixels me paraissent avoir quelque chose de fractal dans leur nature mais mon raisonnement n'est pas encore développé à ce sujet. Il revient, souvent, sans, cependant, encore se matérialiser d'une explication créative! Les macro-pixels constituent, sans nul doute, toute une enchaînage de résonances coordonnées basculant d'un état à un autre en simultanéité. N'importe qui peut expérimenter cela avec les cannabinoïdes psychotropes! L'absence d'un pixel de la conscience signifie simplement que ce pixel est inactif et ne résonne pas. Dans un macro-motif perceptif comme, par

exemple, l'espace de mon champ visuel je suis "conscient" parce il existe une toile, une enchaînures de résonances dans ma mémoire qui correspondent avec tous les micro-motifs, et ce de façon ramifiée, quasi fractale, de ce macro-motif. Par exemple il pourrait très bien (chez le fou) se produire des micro-résonances erronées dans un motif quelconque de mon macro-motif et je serais alors "conscient" de quelque chose d'inexistant! Imaginons que dans un vaste paysage de forêts, de rivières et d'oiseaux tout à coup le motif d'un oiseau stimule la résonance d'un motif de dragon, dans ma mémoire... et hop je serais persuadé que cet oiseau est un dragon! Et encore voyant un vieux barbu son motif hypermétabolise, par exemple, le motif de Charlton Heston jouant Moïse: je serai conscient alors d'un dragon et de l'endomotif Charlton Heston/Moïse!

La folie ce n'est rien d'autre que cela.

C'est ainsi qu'il faut entendre la "fragmentation" de la conscience chez le dérepixélisé: une suite d'erreurs de reconnaissance motifielle engendrant alors des résonances erronées. Pour reprendre un terme d'informatique "l'adressage" de l'information perceptive se fait de façon erroné, suite à un hypermétabolisme local qui engendre des micro ou des macro-illusions, via la rayonnance motifielle. La "conscience" n'est que dans le va et vient d'une information, entretenue dans la durée, dans une résonance. Point à la ligne. Et c'est clair comme du cristal de roche! Cela a des conséquences socio-philosophiques coperniciennes.

What is a thought?

To analyse what is a thought we have to first reason through the observation of visual informational objects. By definition a simple visual thought will contain only one informational object evolving in time through an alternance of MCV and MHV memory. For example, the observation of a moving three-dimensional mushroom in the imaginary space-time of consciousness suddenly giving rise (through a MHV jump) to an ashtray with a candle inside is a simple visual thought. Likewise, a complex visual thought will be composed of an undefined number of informational objects, each following their own path of MHV modifications. However, in complex visual thoughts informational objects can interact between themselves, giving rise to more complexity. In the simple visual thought of a mushroom transforming itself into an ashtray with a candle inside there is a locus in our memory where the mushroom and the ashtray and candle **intersect**. This locus is called an **intersection**.

A thought can evolve in time only by passing through intersections. Intersections are at the basis of potential intelligence. When intersections become more and more complex then intelligence progressively emerges from such a kind of memory. In fact, it is difficult to conceive of intelligences based on different types of memories... Intersections seem to be a **must** for the birth of intelligence. For instance, if there were no intersections in our memory then we would stay visually paralysed with the never-ending observation of a single mushroom, in our above example!

Our memory is, in fact, a **vast array of intersections** between informational objects. A thought, in a small time interval, can then be defined as a sum of intersections plus the sum of their potential mutual

interactions. This applies to vision, sound, olfaction, etc. Biological memories are **intersecting memories** where everything is intertwined, interconnected, and thus highly "compressed". Moreover, the nature of MHV domains makes the imaginary space-time of memory a bit similar to a fractal but this does **not** mean that memory is, in fact, a fractal! Much more work is needed in order to evaluate this idea!

Structure de la Pensée (Structure of Thought)

*Dans un état sérotoninergique de pensée (figure 1) la conscience s'écoule sans quasi intersectionner. Notons, cependant, qu'une pensée simple (un seul objet informationnel se transformant dans le temps) est **granulaire**, c'est à dire qu'elle est composée d'une **suite d'intersections**. Une pensée plus complexe (contenant plusieurs objets informationnels et motifs interagissant entre eux) consiste en le déploiement ordonné, dans le temps, d'une série d'intersections. De loin, si l'on examine notre image, il faut s'imaginer, très grossièrement (car cela est irréprésentable de façon correcte sans faire appel à un formalisme mathématique) la pensée comme une sorte de collier rempli de perles, les perles représentant les intersections successives. A mesure que l'on augmente le métabolisme de la mémoire, la conscience se répand dans des intersections toujours plus nombreuses. Pour imaginer cela vous imaginez votre collier sur lequel vous versez de plus en plus de perles, jusqu'à le submerger complètement. Vous avez, alors, une image de la mémoire qui est un ensemble compact (en première **approximation**) d'intersections, comme on peut le voir sur les figures 6 et 7. Dans la figure 6 on représente une mémoire biologique en train de se constituer et accumulant des intersections. Dans la figure 7, la mémoire est constituée et représente un ensemble si dense d'intersections que l'on ne distingue plus, de loin, les espaces informationnels libres restant.*

Dans l'état normal de la conscience éveillée un train de pensée - figure 2 - (symbolisé donc par une succession de petites perles noires) "rayonne" peu c'est à dire que la pensée ne saute pas, brusquement, aux intersections qui la composent sans pouvoir rebrousser correctement son chemin, si nécessaire. De temps à autre on peut apercevoir des sauts MHV (ici deux sauts) mais ceux-ci, de faible intensité métabolique, n'interrompent pas la continuité globale de la conscience car la rayonnance motifielle étant faible la conscience est incapable de franchir le seuil d'illusion qui la rendrait discontinue, comme sous des doses élevées de cannabinoïdes ou bien sous l'action plus intense des antagonistes des récepteurs au NMDA. L'expression "sauter du coq à l'âne" exprime, familièrement, l'existence de ces sauts MHV de faible intensité métabolique!

*Dans la figure 3 nous symbolisons deux cas de figure rencontrés sous l'influence d'un cannabinoïde psychotrope: le cannabinoïde induit la rayonnance motifielle représentée, ici, par les étoiles rayonnantes. Dans les intersections rendues métaboliquement actives par un cannabinoïde, la pensée devient discontinue et saute sur un autre **trajet** puis répète ce processus (ici nous représentons 6 trains de pensée, 6 sauts du coq à l'âne!), ce qui est représenté en "a". Les intersections métaboliquement actives peuvent éjecter la conscience dans n'importe quelle direction de l'espace multidimensionnel de la mémoire, comme une sorte de **feu d'artifice**, pour prendre une bonne image! Quand ce phénomène se produit, le sujet **oublie** ce à quoi il pensait **avant d'avoir franchi l'intersection** car sa conscience est **incapable de rebrousser chemin** sans se **perdre** en route car si elle retourne vers l'intersection la **probabilité** d'orientation de la conscience dans toutes les directions de la mémoire est **équiprobable**.*

*Il est donc quasiment impossible de retrouver son chemin d'origine ce qui engendre un "oubli" **apparent** seulement. Dans le cas de figure "b" nous associons une benzodiazépine à un cannabinoïde et dans une proportion utile à la découverte créative car nous voulons, simultanément, avoir **accès** aux domaines d'homologies motifielles sans pour autant **tous les oublier** une fois perçu! A cet effet, il faut donc que notre pensée puisse rayonner plus que d'accoutumé dans les intersections mais avec la possibilité de pouvoir rebrousser chemin, c'est à dire de ne pas oublier lors d'un passage sur un point d'oubli potentiel. Cela signifie qu'il faut donc **métaboliquement favoriser la continuité** de la pensée en réduisant l'intensité des rayonnances motifielles afin de ne pas atteindre le seuil d'illusion. Les benzodiazépines augmentant l'atténuation permettent donc de réduire la rayonnance motifielle générée par les cannabinoïdes!*

*Dans ce cas de figure on peut accéder, brièvement, aux domaines d'homologies motifielles sans pour autant irrémédiablement se perdre et être donc capable de retourner sur le chemin initial, ici représenté par la ligne droite et non brisée à chaque section de MHV, comme dans le cas "a". Dans la figure 4, nous symbolisons une pensée vue de loin, c'est à dire qu'elle paraît continue. Imaginons cette pensée comme une **corde** se déplaçant dans la mémoire durant un certain temps. A chacun de ses déplacements, l'intérieur de la corde **balaye un certain volume d'intersections**. Si nous observons une **section** de cette pensée agrandie à l'aide d'une loupe imaginaire (figure 5) et dans un espace de temps infinitésimal (quand Δt tend vers 0) on constate qu'une **section de pensée** (conscience) est un **ensemble** contenant une certaine quantité indéfinie d'intersections et de leurs compositions.*

*La conscience, donc, quand "t" tend vers 0, est un ensemble d'intersections et de leurs compositions. Corollairement, la conscience, **sur un intervalle de temps**, c'est l'intégrale de toutes ces sections. Comme nous le voyons sur la figure symbolique 7, qui représente en trois dimensions, seulement, l'espace multidimensionnel de la mémoire. Notre mémoire est constituée d'une quasi infinité d'intersections qui sont "immobiles". L'immobilité d'une intersection veut dire qu'elle est métaboliquement **inactive**. La mobilité d'une intersection signifie que celle-ci est devenue, métaboliquement, **active, prête à faire partie de la conscience**. Bien entendu la conscience ne peut apparaître que lorsque des **ensembles d'intersections** deviennent métaboliquement actifs. De là nous reformulons notre définition: La conscience, **sur un intervalle de temps**, c'est l'intégrale de toutes les sections de pensée contenant des **intersections métaboliquement actives**. Vue l'immensité intersectionnelle de la mémoire et le Bas-Métabolisme de l'état d'éveil on comprend que la conscience éveillée est **très faiblement consciente...**!*

Intersecting memories store information only once

In an intersecting memory, like our memory, every perception is **not** stored in its entirety. For example, if my memory has stored one complete head of a person, it will then store another head by taking the first head as a reference. Only **differences** between the two dissimilar heads will be stored. Everything similar is stored **once and for all**. So with the passing of time we in fact **store less and less** information as all redundancy is eliminated! This explains why our memory seems so huge with no end! The only thing we seem to store continuously are time coordinates as those time coordinates are **necessary** for the

expression of MCV memory. But even here, I am sure our memory should use a trick to make that work simpler! What is important to have in mind is that any informational object is, in fact, a time hybrid of past stored informations with some small additions of new information.

In dreams we travel to the (endogenous) past

When I left Geneva to live in Asia I noticed a very interesting phenomenon in clear details. This phenomenon is a reflection of how a biological memory stores and retrieves information depending of the metabolic activity going on in the CNS. This phenomenon is that when we dream our consciousness mostly **travels to the past** with only some inclusions of the present! The inclusions of the present seem to be "volume" dependent in that sense that informational objects appearing from the present or near the present appear more frequently as small oneiric volumes than big volumes. The fabric of everyday oneiric phenomena is made of past events situated often more than 15 to 20 years in the past (for let say a 35-year-old person) or more. It is difficult though to reach very early life events. (This is a very important observation which demonstrates that distant memorised events need higher metabolic activity to be recalled. This observation can put to test the idea that ketamine-induced hallucinogenic experiences should, logically, be of a higher metabolic nature than indolealkylamine-induced hallucinations. In fact any hallucination giving rise to informational objects as real as exogenous objects implies a memory metabolism higher than serotonergic hallucinations such as those induced by *psilocine* which is, to me, the reference in serotonergic hallucinations. If near-death experiences are to be interpreted as the memories of very old experiences it necessarily implies that we should be able to demonstrate a surge of metabolic activity when approaching death... Can the sudden release of glutamate give rise to such pre-mortem metabolic activation? A last "*chant du cygne*" of the CNS? This remains to be tested!)

But some badly understood exceptions arise frequently. For instance even though I was in Asia for some years I would rarely dream of Asians, even friends I would see everyday, but I could easily dream of Europeans I would just see for some minutes? Why? This seems to be related to my past in the sense that Caucasians are negatively perceived in my "unconscious" (now conscious!!!) while I feel perfectly at ease with Asians. It so happens that in dreams we are affected much more easily by negative potentially dangerous external informations than by positive ones. This is, evidently, a remnant of our animal inheritance because we have to give more attention to potential dangers than pleasures. Danger has been the stuff of everyday life since the beginning of life itself. So anything perceived as threatening will easily give rise to dreams. Natural paranoia comes first in dreams!

So why do we dream, daily, preferentially of distant endogenous events? Because the recall of memories is directly related to the metabolic activity going on in our memory zones. The higher the metabolism, the further in the past our consciousness travels. This is easily observed in conscious dreams or if one has very good recall of normal oneiric phenomena. As dreaming is a period of higher CNS metabolism than the normal waking state we thus, logically, go back into the past. The same applies with drug-induced hallucinations.

On Disattenuations (Hallucinations)

Disattenuations generated by hallucinogens (disattenuating molecules) are not always identical in nature. They can be classified into different classes, which points to the underlying nervous structures responsible of these:

1. Serotonergic hallucinations (reference: *psilocine*)
2. Cholinergic hallucinations (reference: atropine)
3. Hallucinations induced by NMDA receptors ligands (reference: ketamine)
4. Buprenorphine (opiate) hallucinations
5. Cannabinoid hallucinations
6. Salvinorin hallucinations (salvinorin may be classified, provisionally, as an oneirogen as it seems to connect the waking state consciousness directly into oneiric scenes)
7. Ibogaine hallucinations
8. Harmaline hallucinations

Serotonergic disattenuations are colourful and represent, often, reiterated slowly rotating or static informational objects. Serotonin can be, simultaneously, a pro-attenuation molecule or a disattenuating molecule, depending, probably, on its balance of effects on dopamine. For instance, most serotonergic reuptake blockers increase attenuation. This increase in attenuation is believed to be a consequence of **diminished** dopamine neurotransmission. However, fluoxetine is an atypical serotonergic reuptake blocker as it can induce insomnia, subhallucinations and better recall of dreams contrary to fluvoxamine, for instance, which is a typical serotonergic reuptake blocker.

Typical SSRIs **increase** attenuation and sleep. They also suppress dream recall and can have a beneficial effects on headaches, contrary to fluoxetine. Fluoxetine, very probably, mildly stimulates 5-HT_{2A} serotonergic receptors linked to dopamine, thus giving rise to all the atypical effects observed with this molecule. No pro-attenuation phenomena have been noticed under fluoxetine, **contrary** to other SSRIs like fluvoxamine or zimelidine.

Cholinergic hallucinations are, apparently, monochrome in nature and come suddenly, in flashes. The appearance of letters have often been noticed with anti-cholinergics. Sometimes these letters appeared in a reiterated way. Complex monochrome, translucent, 3 D images can be observed. These images "vibrate" a bit like if they were made of some semi-solid flowing water. Contrary to serotonin, which is involved in attenuation and disattenuation, acetylcholine seems only to be involved in disattenuation: blocking cholinergic neurotransmission can give rise to hallucinations but increase in cholinergic transmission **does not** increase attenuation, as demonstrated with pilocarpine.

NMDA receptor antagonists give rise to disattenuations. How this exactly works is unclear but demonstrates that glutamate is involved in these phenomena. Disattenuations induced by NMDA antagonists are more oneiric-like than serotonergic hallucinations and so reflect a higher metabolic activation than serotonergic disattenuations. These hallucinations are completely similar to natural hallucinations arising when a person approaches death conditions. All over the world the same invariants have been reported in these natural hallucinations. These invariants have been completely experimentally

reproduced by ketamine which is a NMDA receptor antagonist!

It is now believed that when the brain is in a hypoxic state there is a massive release of glutamate and of "endopsychosins" which give rise to these hallucinations. NMDA hallucinogens often induce the perception of "presences" around the experimenter. However, I have also noticed "presences" (in fact a benevolent image of myself!!) with cannabinoids!! Presences could also be felt with buprenorphine and *psilocine*. Under buprenorphine they are overwhelming, while under *psilocine* they are much less overwhelming. With *psilocine* I felt a comfortable presence who would protect me from anything which could happen to me so, of course, I then feel very tranquil and comfortable! Of course all these presences are totally illusory!!!

As risperidone can, apparently, block hallucinations induced by phencyclidine and related compounds it is assumed that glutamate may, indirectly, act as a 5-HT_{2A} receptor stimulant. The nature of hallucinations induced by NMDA receptors antagonists seems to be more complex than those induced by direct 5-HT_{2A} agonists. Unfortunately, I have not studied this myself so I cannot elaborate more on that topic. Buprenorphine, an opiate, can induce interesting faint hallucinations consisting of transparent images of animated people, for instance. The more you concentrate, in darkness, under buprenorphine and the more you feel "closer" to these hallucinations and, sometimes, you may even start to engage in imaginary conversations with imaginary people. Typically with buprenorphine you may feel surrounded by people or "presences" all around you or even see a lot of people surrounding you! This is again reminiscent of oneiric phenomena noted in conditions of low oxygen in the brain, as when someone approaches death... I presume that a person engaged in this activity may completely lose contact with reality! No reiterative phenomena have been noticed by myself. Buprenorphine-induced hallucinations bring to mind what people have reported under NMDA receptor antagonists or the natural diterpene hallucinogen salvinorin A. The mechanism of action of salvinorin A is still unknown but deserves very serious research as it could give new information regarding psychotic states. As I do not have first hand observation with salvinorin I will classify this unusual hallucinogen as an "oneirogen". Why? Because, according to the descriptions of the effects of salvinorin by experimenters, it seems to trigger short pure oneiric episodes. This looks a bit like an artificially induced transient conscious dream flash.

Salvinorin's hallucinations seem to come "only" in darkness and silence. First, some familiar serotonergic-like hallucinations are observed then, all of a sudden, the experimenter is projected into a full transient endoreality while apparently preserving his normal waking state consciousness ([Valdes](#), etc). Salvinorin may, thus, induce short REM episodes while awake and so, literally, suddenly "kick" the experimenter directly into a normal oneiric scene. This has to be explored in the lab yet!

If this hypothesis is correct then salvinorin may become an important tool in investigating more deeply how REM sleep is triggered. We already know that cholinergic cells play an important role in this phenomenon. Salvinorin may or may not act on these cholinergic neurons. So I seriously advise dream researchers to explore the effects of salvinorin... Until now mostly laymen have explored the oneirogenic properties of salvinorin by growing *Salvia Divinorum* (Labiaceae), a Mexican sage which contains this remarkable molecule (for more informations on this topic, make a net-search with Alta-Vista!).

Cannabinoid hallucinations are generated only with heavy doses of cannabis sativa. They are coloured and animated and exhibit typical MHV transformations. Cannabinoid hallucinations are not only visual but also auditory and consist of sounds increasing and then decreasing in intensity and also transforming into other sound patterns through audio MHVs. Sometimes red seems to predominate, like with MDMA induced hallucinations or just simple hallucinations induced by concentration. However, MDMA hallucinations differ from cannabinoid hallucinations as informational objects appear as if composed of a multitude of stacked slices (*feuillettes*). The red colouring predominates under MDMA while disattenuations induced by *psilocine* start (in my case) by a sudden intensification of darkness: closing your eyes you seem to observe an extraordinary intensity of black spreading all over your visual field! Then reddish or greenish "treillis" shapes appear giving rise to informational objects flowing through MHVs.

An interesting observation under cannabinoids is the appearance of a red tunnel where you seem to be moving inside. The entrance of this tunnel is like the corolla of a *Convolvulus* flower! This is reminiscent of descriptions by people who were near to death... So cannabinoids may share some common properties with NMDA receptor antagonists. As regards cannabinoids, you can notice a strong time distortion which seems GABAergic in nature as it can be substantially reduced by GABAergic agents such as benzodiazepines, at least when the dose of cannabinoids is subjectively small. GABA is also involved in attenuation as benzodiazepines enhance attenuation while privation of benzodiazepines in a benzodiazepine-dependent subject gives rise to disattenuations. Baclofene, a GABA_B agonist, can induce false recalls during the waking state, similar to what can be experienced in dreams. You will properly observe exoreality under baclofene but you will have a lot of imaginary memories interfering with your thinking.

Reiterations and other phenomena

This is a very important topic as reiterations, often observed with focusing or with serotonergic disattenuating substances, express some basic laws of image synthesis by the CNS. Reiterative phenomena have also been observed by people undergoing a delirium. My opinion is that reiterations are the products of MHV domain activation. As you "heat" a MHV it naturally starts to radiate its slices into consciousness thus giving rise to reiterations. Many invariant phenomena can be observed under disattenuating molecules or through focusing. One of these is when an informational object becomes "soft". For instance you watch a moving aircraft and, suddenly, its wings become soft and fall down! Dali has expressed this very well in his paintings of soft watches! In fact, many of Dali's paintings contain typical things observed in disattenuations. So, I guess, Dali had the ability to observe some of his visual thoughts and paint them. Another thing often noticed in disattenuations are "*aigrettes*" (slivers?). *Aigrettes* are typically observed not only in hallucinations but also in art, especially, in Siamese art. These *aigrettes* bring to mind similar *aigrettes* observed in fractal objects.

An interesting side-topic of my research on hallucinations is that "flying saucers" reports cannot be explained by hallucinations as they mostly never contain any trace of hallucinatory phenomena! So "flying saucers" are not the products of hallucinations and can be understood only in terms of lies,

confabulations, or description of authentic unknown phenomena. Flying saucers are very rarely reiterated, never contain *aigrettes*, do not "melt" like Dali's watches and do not transform into other bizarre objects through MHV jumps!!! For instance, if flying saucers were hallucinatory in nature they should transform into other hallucinatory objects through homologous patterns: descriptions of flying saucers giving rise, let us say, to a woman's breast, etc, should frequently be observed! In the field of religion, however, things described by religious observers fit in with hallucinatory phenomena: reiterated angels, presence of benevolent "spirits" (as observed under cannabinoids, buprenorphine or *psilocine*), visions of the clouds "opening" (easily seen under *psilocine*!). One *psilocine*-induced phenomenon, however, can be sometimes found in "flying saucer observations" like the sense that time becomes still. So when a person reports "flying saucers" together with an alteration of time perception, this is, very probably, hallucinatory in nature.

From reiterations to complex images: amplification cascade of interaction/synthesis

Under kava (*Piper methysticum*) I can see beautiful reiterations for some minutes! For instance, today I started to see maybe about a dozen *poissons-papillons* (*Chaetodon* fish). I could distinguish them concentrated somewhere in my visual field as if they were in a translucent bowl. When the *Chaetodon* appeared they appeared in 3 dimensions and frozen. There was no movement. Suddenly, all of them started to rotate slowly from right to left (in my case reiterations very often seem to rotate from right to left...). But, contrary to normal reiterations, these *chaetodon* were not all similar! They were different in shapes and colours and even I could see non-*chaetodon* fish like the famous "houmouhoumou-noukounoukou-apouaa", a kind of "Baliste" (*Balistes*, in Latin)! But still all these informational objects were of the fish class, meaning that an MHV of fish was getting metabolically active and radiating some of its slices as different fish. The metabolism of this MHV was, logically, higher than usual otherwise it would have kicked only similar fish into my consciousness. When the fish started their slow rotation I noticed one orange *Forcipiger longirostris* (a kind of *Chaetodon*) going out of the pack and swimming to the left! Suddenly I got an insight as how the brain could proceed in order to generate complex images via simultaneous activation of multiple different MHVs.

We have to come back here, to this very important phenomenon which is at the root of imagination and creativity: **information-synthesis**. Watching my *Chaetodon* I could well imagine that they sprouted from different slices of a common MHV because those slices were, informationally speaking, further apart from one another than in usual reiterations. Then I saw all these *Chaetodon* coalesce into a **larger** brownish fish while realising that this process was certainly due to a sudden interaction/synthesis phenomenon going on **between** all those fish! I then realised easily that complex images are generated by a myriad of MHVs being activated and then giving rise to mutually interacting MHV slices in an ever-ongoing process of interaction/synthesis ramifying in all directions of the imaginary space-time of memory. This brings fractals to mind, but fractals are simple and static, not complex and self-interacting. It is a bit difficult to transcribe into words but I could explain all this very well through an animation! Any company who would like to make those animations should contact me! Watching the animation gives you the answer instantaneously, as it is so crystal-clear, so evident! So this process of activation of

myriads of mutually interactive MHVs, through a very high rate of interaction/synthesis, can elegantly generate all the complexity of an animated 3-dimensional dream MCV box. To explain that to you, clearly, is another matter... mama mia!

A New Philosophy of Reality: Psychopharmacophilosophy

Traditional philosophy is outdated and should now be replaced by a new philosophy which I termed "psychopharmacophilosophy" while working in Siam. Psychopharmacophilosophy has an extraordinary importance as it shatters completely many deep-seated beliefs of human beings. For instance, it clearly demonstrates that **all** religions are human creations and not "divine". We have to become used to that! There is no other choice. If all the mystics of history had been subjected to haloperidol or risperidone they would have never persuaded other human animals that they were in contact with the essence of reality... Religion is a consequence of the architecture and functioning of our memory which leads us to create imaginary structures with no counterpart in exoreality. Psychopharmacophilosophy also clearly demonstrates that all human thoughts and emotions are the consequences of underlying neurochemical events. This, in turn, makes human "logic" highly suspect of continuous bias and distortion... When a person tries to have a "logical" discourse is she purely logical, like a machine, or is she intrinsically biased because of her particular brain functions? The answer is that she is **always** biased!

Some dopamine here and, say, Robert will say discourse "A". Some more serotonin there and Robert will have discourse "B"! Some tyrosine hydroxylase activation and Robert may very well give rise to discourse "C", etc, etc, etc, and bla, bla! So no logical discourse is really "logical" as it contains suspicious subjectivity, a subjectivity which cannot be erased at all. Our CNS works like that, not like a purely logical computer! In this subjectivity we nearly always find **dominance** as Henri Laborit has well demonstrated... All human beings seek dominance, consciously or not. When you are aware of that you do not converse any more with others unless you are sure that their "logical" arguments **are not** based on a desire for dominance... This is the reason why Laborit hated to talk with people and much preferred writing. True communication will be achieved only when the human desire of dominance has been completely eradicated in the future CNS remodelled through Neuromorphogenetics. This desire of dominance is commonly seen in the "*fonctionnaires*" scientists!! It is a primitive behaviour that they share with monkeys and wolves...

Claude Rifat

For further information on conscious dreaming, see also [Florence Ghibellini's conscious dreaming site](#).



Claude

ETHNOPHARMACOLOGY OF SKA MARIA PASTORA (SALVIA DIVINORUM, EPLING AND JATIVA-M.)

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Summary

Salvia divinorum is a perennial labiate used for curing and divination by the Mazatec Indians of Oaxaca, Mexico. The psychotropic effects the plant produces are compared to those of the other hallucinogens employed by the Mazatecs, the morning glory, *Rivea corymbosa* L., Hallier f. and the psilocybin-containing mushrooms. A discussion of the role of ska Maria Pastora in the native "pharmacopeia" is based on previous reports and fieldwork by the authors, with a Mazatec shaman.

Introduction

Salvia divinorum (Epling & Jativa-M.) is a perennial herb in the Labiatae (mint family) native to certain areas in the Sierra Mazateca of Oaxaca, Mexico (Fig. 1). It is one of about 500 species of *Salvia* in the New World subgenus *Calospatha* (Epling and Jativa-M., 1962). The plant grows in large clones to well over 1m in height and its large green leaves, hollow square stems and white flowers with purple calyces are characteristic taxonomic features. This sage has been found only in forest ravines and other moist humid areas of the Sierra Mazateca between 750 m and 1500 m altitude (Diaz, 1975a). Carl Epling, who first described *S. divinorum*, reported the newer as having a blue corolla, and it has been illustrated this way in the literature (Epling and Jativa-M., 1962; Schultes, 1976). However, this description has been

shown to be an error, as all living specimens of the plant have had blossoms with white corollas and purple calyces (Diaz, 1975a; Emboden, 1979).

S. divinorum is one of several vision-inducing plants employed by the Mazatec Indians, one of the native Peoples living in the mountains and upland valleys of northeastern Oaxaca. Unlike other Mexican tribes, there is little information concerning their existence before the arrival of the conquering Spanish, who reduced the Mazatecan population through exploitation and disease (Weitlaner and Hoppe, 1964). The 1970 census estimated their number at 92,540 (Cortes, 1979) and the language of the Mazatec-Popoloca family is one of the many non-Spanish dialects spoken throughout Mexico (Weitlaner and Hoppe, 1964). The Mazatecan ritual use of hallucinogens, such as mushrooms containing psilocybin and morning glory seeds containing lysergic acid amide, has been widely publicized through the investigations of R. Gordon Wasson and Albert Hofmann, among others (Wasson and Wasson, 1957; Wasson, 1963; Hofmann, 1964; Hofmann, 1980).

Review of literature

Although the use of the mushrooms and morning glories was documented by the Spanish conquistadores and chroniclers who arrived in Mexico during the Sixteenth Century (Wasson, 1963), the literature on *S. divinorum* is relatively recent. Wasson originally proposed that this *Salvia* was the plant known to the Spanish by the Nahuatl (Aztec) name of *pipiltzintzintli*, but new investigations suggest that the Mexican name probably refers to *Cannabis sativa* L. (Diaz, 1979).

There are a number of common names for *S. divinorum* and nearly all are related to the plant's association with the Virgin Mary. It is known to the Mazatecs as *ska Maria Pastora*, the leaf or herb of Mary, the Shepherdess. The name is usually shortened to *ska Maria* or *ska Pastora* and the sage is also known by a number of Spanish names including *hojas de Maria*, *hojas de la Pastora*, *hierba (yerba) Maria* or *la Maria*. The Mazatecs believe this *Salvia* to be an incarnation of the Virgin Mary, and care is taken to avoid trampling on or damaging it when picking the leaves, which are used both for curing and in divination.

Attempts at the identification *ska Maria Pastora* were carried out in conjunction with anthropological expeditions led by one of Mexico's leading anthropologists, the former Austrian engineer, Roberto G. Weitlaner, who rediscovered native use of hallucinogenic mushrooms among the Mazatecs in 1936 (Wasson, 1963). On a field trip in 1938, Weitlaner's future son-in-law, the American anthropologist, Jean B. Johnson learned that the Mazatecs employed a "tea" made from the beaten leaves of a "hierba Maria" for divination. The preparation was used in a manner similar to the "narcotic" mushrooms and the *semillas de la Virgen*, which were later identified as morning glory seeds (Johnson, 1939). Bias P. Reko, who knew Weitlaner well, referred to a "magic plant" employed by the Cuicatec and Mazatec Indians to produce visions. It was known as the *hoja de adivinación* (leaf of prophecy) and although Reko could not identify the plant, it was probably *S. divinorum* (Reko, 1945).

In 1952 Weitlaner reported the use of a *yerba (hierba)-de Maria* by the Mazatecs in Jalapa de Diaz, a

small Oaxacan village. According to his informant the leaves of this plant were gathered by curanderos (shamans or healers), who went up into the mountains and harvested them after a session of kneeling and prayer. For use in "curing" the foliage was rubbed between the hands and an infusion of from 50 to 100 leaves was prepared, the higher dose being used for alcohol "addicts". Around midnight the curandero, the patient and another person went to a dark quiet place (perhaps a house) where the patient ingested the potion. After about 15 min the effects became noticeable. The subject would go into a semi-delirious trance and from his speech the curandero made a diagnosis and then ended the session by bathing the patient in a portion of the infusion that had been set aside.

The bath supposedly ended the intoxicated state. In addition to such "curing", the yerba Maria also served for divination of robbery or loss (Weitlaner, 1952).

Five years later the Mexican botanist, A. Gómez Pompa, collected specimens of a *Salvia* known as "ska (sic) Pastora". He noted that the plant was used as a hallucinogen (alucinante) and a dose was prepared from 8 to 12 pairs of leaves. Since flowering material was not available, the sage could not be identified beyond the generic level (Gómez Pompa, 1957). The holotype specimen of *S. divinorum* was acquired by Wasson and Hofmann in 1962 while they were traveling with Weitlaner. Flowering plants were brought to them in the village of San Jose Tenango, as they were not permitted to visit the locality in which ska Maria Pastora grew. This collection was sent to Epling and Jativa-M. who described it as a new species of *Salvia*, *S. divinorum* (Wasson, 1962; Epling and Jativa-M., 1962).

Wasson was the first to personally describe the effects of ska Pastora, relating the experiences he and members of his party had on ingestion of different doses of a beverage prepared from the plant's foliage. At a session in July 1961 in which he participated, a curandera (female shamans are very common among the Mazatecs and other Mexican peoples) squeezed the juice of 34 pairs of leaves by hand into a glass and added water. Wasson drank the dark fluid and wrote that although the effects came on faster than those of the mushrooms, they lasted a much shorter time. He saw only "dancing colors in elaborate, three-dimensional designs" (Wasson, 1962). Summing up the experience, he later stated (pers. comm.): A number of us (including me) had tried the infusion of the leaves and we thought we experienced something, though much weaker than the *Psilocybe* species of mushroom.

Hofmann and his wife, Anita, who accompanied Wasson on an expedition the following year, took the infusion prepared from five and three pairs of *S. divinorum* leaves, respectively. Mrs. Hofmann "saw striking, brightly bordered images" while Hofmann found himself "in a state of mental sensitivity and intense experience, which, however, was not accompanied - by hallucinations" (Hofmann, 1980).

Maria Sabina, the Mazatec shaman made famous by Wasson, and who lives in the Mazatec highland town of Huautla, in Oaxaca, briefly mentioned her use of the plant in her autobiography (Estrada, 1977):

If I have a sick person during the season when the mushrooms are not available, I resort to the hojas de la Pastora. Crushed (molido) and taken, they work like the "children" (i.e., the mushrooms). Of course, the Pastora doesn't have as much strength.

Roquet and Ganc reported that the Mazatecs prepared a dose of *S. divinorum* from 120 pairs of crushed leaves and used the plant only when the mushrooms and morning glory seeds were not available. Roquet and his associates used the plant twice in their psychiatric investigations of Mexican hallucinogenic plants and stated that they had difficulties in working with it (Roquet, 1972).

Jose Luis Diaz and his coworkers studied the use of *skia Maria Pastora* in the Mazatec highlands during the 1970's. Diaz himself took the *Salvia* infusion under the supervision of a shaman, Dona J., on six different occasions, noting an increased awareness of the plants effects each time. The first changes he perceived were a series of complex and slowly changing visual patterns that occurred only in complete quiet with closed eyes. There were no colored geometric patterns which characteristically occur with ingestion of other hallucinogens nor were there auditory images. After a short time he noticed peripheral phenomena, such as a feeling of lightness in the extremities and odd sensations in the joints. The climax of effects, accompanied by dizziness or nausea (*mareo*), lasted about 10 min and disappeared about 0.5 h after ingestion of the infusion. Other, more subtle, effects seemed to persist for a few hours (Diaz, 1975a).

Hofmann (Hofmann, 1964) and Diaz (Diaz, 1975a) each investigated *S. divinorum* chemically without isolating and identifying any active principle. As noted above, the descriptions in the literature emphasize the mildness of the plant's effects. There are many ways to achieve visions other than by ingestion of classically defined "hallucinogens" such as mescaline, LSD and psilocybin. Among these are meditation, prayer, mental illness, disease (especially when accompanied by fever), poisoning, experiences of dying, and suggestion (placebo effect). Therefore, prior to conducting chemical and animal studies, we decided to attempt to clarify the role of *S. divinorum* as a vision inducer among the Mazatec Indians.

Mazatec healing

The following report is based on fieldwork with a Mazatec curandero, or healer, living near the Alemin Reservoir in the Mexican state of Oaxaca, about 100 km from the port of Veracruz. Although a study based on information from a single source is open to criticism, the jealous and secretive nature of native shamans works against statistical methods of survey.

Visiting many shamans in a single area can actually lessen the amount of information gathered, as each curandero may fear the visitor is telling their secrets and giving their "power" to a rival. To them magic can hurt or kill. Wasson and Richard E. Schultes have both commented on the difficulty of making contacts with the curanderos of this region (Wasson and Wasson, 1957; Schultes, 1941).

Don Alejandro, the informant, spoke only a Mazatecan dialect. One of his sons served as an interpreter, translating from the native tongue to Spanish. The information they provided the authors was gathered in fragments over many visits during the summer of 1979 and spring of 1980. Mazatec healing and religion are united in a manner common to traditional cultures. This is somewhat foreign to Western scientific medicine which is isolated from religion except for the times when it no longer serves to cure. A brief description of Mazatec healing, based mainly on the work with Don Alejandro should help to explain the use of *skia Maria Pastora* and its relationship to other healing plants. The Mazatecs (the name, taken from

the city of Mazatlan, was actually imposed on the natives by the Spanish) are nominally Catholic Christians, but they have incorporated many features of their traditional beliefs into their conceptions of God and the Saints, whom they consider to have been the first healers. The most prominent among them is San Pedro, or Saint Peter, who is said to have cured a sick and crying infant Jesus through the ritual use of tobacco (*Nicotonia* spp.). Tobacco is considered to be a health problem in the United States and many other countries, and its acute pharmacological effects are due to the alkaloid nicotine (Larson et al., 1961). Yet for the Mazatecs, as well as for almost all Mesoamerican Indians, it is the most important curing tool in the "pharmacopeia". The fresh tobacco leaf is ground, dried and mixed with lime to form a powder known to the Mazatecs as San Pedro (Saint Peter); the "best" is prepared on the Saint's day, June 29th (Inchaustegui, 1977). This preparation is more familiarly known by its Nahuatl name, picietl @piciete). It is worn-in charms and amulets as a protection against various "diseases" and witchcraft, but its most important use is in limpieas, or ritual cleansings. It may be used alone with a prayer and copal (an incense prepared from the resin of *Bursera* spp.) (Diaz, 1975b), or in conjunction with herbs such as basil (*Ocimum* spp.) or marijuana (*Cannabis sativa*)*, eggs or various other substances. Anyone who comes to Don Alejandro to be treated usually gets a : limpia This ritual cleansing may be the cure in itself, or it may be accompanied by other "medicines". The patient is given a pinch of the San Pedro powder (wrapped in paper) to carry with them and use during the healing period.

One learns to become a shaman through an informal apprenticeship, although the Mazatecs will insist they are taught by a progression of visions from and of heaven, rather than by people. Psychotropic plants are intimately associated with this training, which can last up to two years or longer. In this area of Oaxaca, as well as the highland region visited by Diaz, +Don Alejandro does not use marijuana, as it is illegal. The vision inducers are taken systematically at intervals of a week to a month. Once one becomes a healer the hallucinogenic plants are ingested much less frequently. The process begins by taking successively increasing doses of *S. divinorum* for a number of times to become acquainted with the "way to Heaven". Next comes mastery of the morning glory (*Rivea corymbosa* (L.), Hallier, f.) seeds and finally one learns to use the sacred mushrooms. There is a very' rigid diet, or diet, to follow during this time, "Hot" foods such as garlic and chili peppers are restricted and there must be abstinence from sex and alcohol for extended periods. However, many Mazatec shamans incorporate alcohol into their training and drink during their ceremonies (Wasson and Wasson, 1957). Breaking from this dieta, or ritual diet could "make one crazy," according to Don Alejandro and since I such obligations require maturity, one should be at least 30 years old before becoming a curandero.

A comparison of Mazatec hallucinogens

Ska Maria Pastora is, pharmacologically the weakest of the three hallucinogenic plants. Following its ingestion the Virgin Mary is supposed to speak to the individual, but only in absolute quiet and darkness. The relatively mild experience is readily terminated by noise (such as a loud voice) or light. Don Alejandro says the effects of tu-tu-sho, the flower seeds (*R. corymbosa*), are similar to those of the Maria (*S. divinorum*) as both plants are siblings (son hermanos) under the protection of the Virgin Mary and San Pedro. A "dose" he provided weighed 9.6 g and consisted of about 350 *R. corymbosa* seeds. A brief report on another morning glory (*Ipomoea purpurea* Both) noted that the ingestion of a large number of

seeds produced effects similar to LSD, but with an additional narcotic component characterized by drowsiness and torpor (Savage et al., 1972). Humphry Osmond also noted a narcotic effect on dosing himself with *R. corymbosa* seeds (Hoffer and Osmond, 1967). The activity of morning glories appears to be due to d-lysergic acid amide (ergine) and related alkaloids (Schultes and Hofmann, 1980). Interestingly, the authors discovered a woodrose (*Argyrea* spp.) growing in the vicinity of the village where Don Alejandro lived. *Argyrea* spp. contain LSD-like compounds (Chao and DerMarderosian, 1973). When asked whether he used the plant, Don Alejandro said that he did not, since it caused people to become crazy. The curandero also had several horticultural specimens of *Coleus* spp. growing near his house. Wasson has reported that the Mazatecs believe *Coleus* to be a medicinal or hallucinogenic herb closely related to *S. divinorum* (Wasson, 1962). However, Don Alejandro said the plants were not medicinal and his daughter had bought them at the market because they were pretty.

According to Don Alejandro ni-to, or the mushrooms-that-one-takes (*hongos para tomar*, probably not a literal translation, see Wasson, 1980) are unlike the other two plants. The fungi are *delicado* (delicate), *nervioso* (nervous), *una cosa de envidia* (a thing of envy). Unfortunately the English translations of these terms do not convey the Indian-Spanish concept of magic that has a dangerous and sinister side. Santa Ana and San Venanzio, the Saints the curandero associates with the mushrooms, were not as good at healing as San Pedro and the Virgen Maria, the patrons of the Saliva and the morning glory. Eating too many of the fungi can "leave one crazy" and the visions are often *trucos* (tricky). Other Mazatec informants have attributed such characteristics to the visions, saying that one has to separate the true from the false (Inchaustegui, 1977). Wasson has reported that misuse of the mushrooms can lead to madness (Wasson and Wasson, 1957). Munn and Wasson have given complementary descriptions of shamanic use of mushrooms among the Mazatecs (Munn, 1979; Wasson 1980). Psilocybin and psilocin, the vision-inducing compounds in the fungi, were isolated by Hofmann, who used himself as a subject to assay for their activity. He reported that a dose of 2.4 g of dried *Psilocybe mexicana* Helm (an average amount for a curandero) produced effects he could not control or resist. A colleague "was transformed" into an Aztec priest and at the height of the experience Hofmann felt that he "would be torn into this whirlpool of form and color and would dissolve" (Hofmann, 1980). This powerful experience was quite unlike the mild one produced by *S. divinorum*. As Don Alejandro stated it, "The Maria, on the other hand accepts you (*la Maria, en cambia, te acepta*)."

Remedial uses of *S. divinorum*

From the shaman the investigators learned that the plant could be used as a "medicine" as well as for the induction of visions. A low dose serves as what the investigators interpreted to be a "tonic" or "panacea" as well as for "magical" healing (Don Alejandro did not use such terms). An infusion prepared from 4 or 5 pairs of fresh or dry leaves may be taken by the glass (*vase*) or tablespoonful (*cucharoda*) as needed. It is used to "cure" the following "illnesses", although there may be other possible uses:

1. It helps one defecate and urinate. It stops diarrhea (the plant apparently is believed to regulate eliminatory functions).
2. It is given to the sick, old or dying to revive them or alleviate their illness. People who are pale,

- white and almost ready to die (they have "anemia") may recuperate on taking la Maria.
3. It may be taken to relieve headache and rheumatism (however, when taken in the high doses that induce visions; it often leaves one with a headache the following morning, according to the curandero).
 4. There is a semi-magical disease known panzón de barrego (sic), or a swollen belly, which is supposedly caused by a curse from a brujo, or evil sorcerer. The victim's midsection swells up due to a "stone" that has been put inside them. Taking the Salvia causes elimination of this "stone" and the belly shrinks down to size. The researchers met an old shaman who showed them his wrinkled middle and said he had cured himself of the "disease" by use of la Maria. Don Alejandro confirmed the "illness" and the "cure".

Divination with *S. divinorum*

S. divinorum may be prepared as an infusion from 20 (about 50 g) to 80 (about 200 g) or more pairs of fresh leaves to induce visions, and may be taken by the curandero, the patient (or apprentice) or both, depending on the situation. Only fresh foliage will serve for divination; At this dosage level, the Salvia is used to foretell the future, find the causes and cures of illnesses and obtain answers to questions about friends, enemies and relatives. In shamanic training, the future healer takes la Maria to learn the ways of healing and the identification and use of medicinal plants (there is supposedly a tree in Heaven with all such herbs on it and one talks to God and the Saints about them under the influence of the hallucinogens). After preliminary sessions in the company of the master, who takes the infusion along with the apprentice to watch over him on the journey, the future healer may continue study on his own until it is time for the next plant in the series. Don Alejandro told the investigators that the Salvia, the morning glory seeds and the mushrooms each told their own historic (story or history: and ska Maria was the best teacher of the ways of curing, as one learned the most from it. During the course of visits, the researchers were able to participate in two sessions under the shaman's guidance. As the hallucinogens are never taken without a valid purpose and since the visitors were from "the University", the ceremonies were oriented to teach them about healing and especially the uses of the Maria and other medicinal plants. Don Alejandro said they would have to follow the dieta, or ritual diet for 16 days, although they could bathe and drink beer (after the first time, the dieta for *S. divinorum* is only 4 days in length).

The preparations for the two ceremonies were essentially the same. As dark came (about 19:30 h to 20:00 h) the curandero began making the Salvia infusion. The leaves were first counted out in pairs to arrive at each person's dose and put neatly into piles with their petioles aligned. Then Don Alejandro picked lip part of a pile and crushed it by hand into a small enameled bowl partially-filled with water. As more foliage was squeezed and added, the liquid turned dark green from the chlorophylls. After the potion was prepared, it was poured through a sieve into a glass which was topped off with water. During the preparations for the second session a head of foam formed on the glasses and the curandero laughed. He explained through his son that the foam (espuma) was an indication of strength and the Maria would be very potent that evening. The glasses were covered with inverted cups to "prevent the escape of the humor (que no salga el humor)". Although the foliage of *S. divinorum* could reportedly be kept fresh for a week or longer when wrapped in the large leaves of *Xanthosoma robustum* Schoff, the prepared infusion

was said to be stable for a day. The spent leaves were set aside to be discarded in an out of the way location where they wouldn't be defiled by people or animals. However, Don Alejandro said that they could still be used by putting them on a subject's head to refresh them after the session. The curandero picked up a glass of the Maria and began an oration. The Holy Trinity, Saint Peter, the Virgin Mary and other Saints were called on to watch over the participants and teach the visitors the ways of curing:

In nomine Spiritu Santo (this "Latin" phrase was always translated into the vernacular as:

In the name of the Father, the Son and the Holy Ghost)

Most Holy Lord Saint Peter

In the name of Leandros (the subject),

In nomine Spiritu Santo

Maria, show Leandros,

that he may see what there is in the world

For he wishes to study all the classes of medicines

Lord Jesus Christ, show him

May he learn

May he see all the classes of medicinal plants

You, who know all, show him

I want you to show him all the different kinds

of illnesses and remedies that exist in the world

In a short time he must learn your story

In nomine spiritu Santo

Most Holy Sainted Rosary

Set him free, that he may see it

Show him as you have shown me

May he recognize all that is the Universe,

All that is you History

He wishes to learn out of love and sincerity

I want you to show him, as I am asking your favor

You, Maria and Lord Jesus Christ, amen

If there is bad or good, save him

Help him out of sincerity and love

In nomine Spiritu Santo

Most Holy Lord Saint Peter

You too, Maria, show him

Set him free that he may see it

Do not be deceptive

This day, on this very date

he is going to take it (the Salvia infusion)

In nomine Spiritu Santo

Most Holy Lord Saint Peter

Help this Leandros

May he grow more, may he learn things

*Show him all that there is in the world
All that is good
All that is medicinal
In nomine spirit Santo
Most Holy Lord Saint Peter
Lord Saint Anthony, Lord Saint Peter, Jesus Christ
You are the only three who know about la Maria
You must show him all that is medicinal
All that is the Universe
All that is your History
Show him, do not be bad
In nomine Spiritu Santo
Holy Sanctuary, Lord Santa Ana
You who are good, You must help him
so that he becomes acquainted with our Universe
You must teach him what I ask
to that it will be to the Lord Saint Peter's pleasure
Let Leandros take it (la Maria)
In nomine Spiritu Santo
Most Holy Lord Saint Peter*

Two to four hours passed in conversation and the telling of stories. The shaman repeatedly emphasized that it was important to describe one's visions, "If you are going to learn or if you are going to understand what it is all about, you must speak." Finally it was time for ingestion of the infusions (between 21:00 h and 23:00 h). Following Mazatec custom, at least one person didn't participate, in order to watch over the rest (Wasson et al., 1974). As a last protection against any dangers during the visionary "travels", Don Alejandro performed limpias, or ritual cleansings, on the visitors. As the oration was being recited, Don Alejandro anointed the subject with a piece of copal dipped in the San Pedro. The curandero then gave him a pinch of the San Pedro to carry for protection if he felt danger during or after the session. After a final benediction, the potions were drunk and the light was turned out.

Session 1, August 18, 1979

The participants were Diaz, Valdes and Don Alejandro, whose son sat on a bench and watched over the others during the proceedings. The curandero and Diaz, who had taken la Maria several times previously, each had doses prepared from 50 pairs of leaves. Valdes received a beginner's dose made from 20 pairs. They took the Salvia preparations around 22:30 h. The visitors shared a large cot while the shaman lay on a petate, or sleeping mat which was unrolled on the floor.

Diaz sat quietly on the side of the cot after the lights went out. About 15 min after ingesting the infusion he began to see subtle visions, constricted like columns of smoke in the total darkness. It made no difference whether his eyes were opened or closed. Deciding to speak out, he saw a light which disappeared as he began to describe it. The images increased in intensity. He saw a mountain made of ice,

as though he were at the base of a cliff formed from large ice columns. The vision slowly changed into Cerro Rabón, a nearby mountain intimately associated with Mazatec legends (Inchiustegui, 1977). About 23:00 h the flow of images changed into lights of various shades of blue, indigos and purples, scattered as if in a spatial vacuum. Depending on his perspective, he was either traveling through them or else they were being projected toward him. He saw a cross being encircled by a light and a mantle. As he described the imagery in words, it seemed to be fixed more clearly in his memory and he felt it would aid in later recall of the experience.

Some 45 min after the light went out, Don Alejandro began to speak in a monotone. His son did not interrupt to translate from the Mazatec. As the shaman spoke, Valdes (who had only experienced a few brief visions which he hadn't described) saw a black sky with brightly-colored objects floating in it. He suddenly found himself speeding toward one and actually felt he was accelerating through space past the rest. The light turned out to be a Mazatec village similar to that of the curandero. Valdes saw it from above, as if he were on a hill. Shapes, like kaleidoscopic pillars of smoke, were at the sides of some of the houses. Then he was suddenly back in space, receding away from the vision.

Don Alejandro stopped speaking, turned on the light and went to look for a "spy" he had heard outside the house. He found nothing, but forced himself to vomit, which he said would end his visions. The session had lasted about 1 h, and the following hour was spent in discussion of what had been seen. The curandero told the two visitors that he had watched over them during the session and ascertained what they needed to know. The old man said that after a few more experiences Diaz would learn to heal and use the medicinal plants. He mentioned a woman, a doctor like Diaz, who would try to interfere with or get involved in his work. Don Alejandro emphasized to Valdes, who had remained quiet throughout the night, that it was necessary to speak out about the visions and he would need many sessions before he would learn how to heal. Everyone then went to sleep and rose early the next morning.

Session 2, March 6, 1980

During this much less formal session Diaz and Valdes took the infusion of *S. divinorum* and were monitored by Don Alejandro and his son, as well as by Paul, who tape recorded events throughout the afternoon and evening. The researchers arrived at the village around 17:00 h and the shaman spent the entire afternoon and early evening talking with them about his visions of "Heaven" and the office (escritorio) he had there, near. God and Jesus. He recounted many tales and legends, including one about the origins of healing. It was a very enjoyable afternoon which provided an excellent set and setting (Weil, 1972) for the visitors' experience with la Maria Diaz and Valdes received infusions prepared from 60 and 50 pairs of fresh *S. divinorum* leaves, respectively. They drank the prepared potions at 21:00 h and lay down in Don Alejandro's bedroom while the curandero's son and Paul sat on a bed next to them. Don Alejandro remained in the other room. The two researchers spoke in turn and were questioned by the younger Mazatecan whenever there was a lull in their speech:

Paul -- Nine o'clock, Leander and Jose Luis are drinking (the Salvia infusion). . .

Diaz: *Nueve doce (he looked at his lighted watch). Empiezo a sentir algunos de 106, de los efectos de la planta. Me siento muy relajado. Y he tenido en los últimos minutos muchas imágenes de plantas y flores. Mucha, muchos tipos de flores diferentes. ... algunos de ellos desconocidos para mi... De muchos colores. Siento mi cuerpo muy suave, como ligero. En los últimos momentos empezaba a se... veí algunas imágenes como de puntos de luz.*

Nine- twelve.

(Spanish deleted from here on - All dialogue is translation)

I am beginning to feel some of the, of the effects of the plant. I feel very relaxed. And I have had, in the past minutes, many images of plants and flowers, Many, many different kinds of flowers . . some of them unknown to me . . . Or many colors. My body feels very mellow, as if it were light. In the past moments I began to see some images like points of light.) That's all for now.

Valdes: *...plants and flowers. I think they were what people call eidetic images, cause I saw them when I first closed my eyes. They've disappeared. I feel like I'm being twisted around inside of my body. Very, very strange sensations, like I'm being... twisted. Boy, like I'm spinning.*

Nine-twenty.

Diaz: *The. . . the sensation of lightness of the body is more intense. In a given moment I felt as though . . . as though I were floating through a root and the images of plants have changed and now I have had sensations like floating in the night full of stars and I realize that it isn't... it isn't easy to have... that it isn't easy to have the, the faith that he. . . that he asks of us. That he asks of me. I feel very. . . very, like very moved. All these things. That's all for now.)*

Son: *Jose Luis?*

Diaz: *yes?*

Son: *Do you see any more images?*

Diaz: *Yes, a little. I have seen more, but it has not been very intense, no? I have seen.. as though I were floating in the sky, as though I had entered a large boat or something like that. And. . . and as if all the things inside were all very mechanical like a machine that was very... very precise and very geometric. And in.. . and curiously, as if in some cases there were again flowers inside the place. And again I began to see like many flowers, but as if*

they were all mechanical, as if they were not...real.

Son: *Christ? Didn't you see him?*

Diaz: *Well... no. At times I thought about him, but he didn't appear as an image, no? At times I thought about some of the images which. .. which Don Alejandro described to us. Of the offices and.. .But, but nothing else.*

Son: *They didn't show you everything.*

Valdes: *...down. It's very very hard for me to talk. Like something's pushing me down into the bed. My arms are very, very sore. (Dog barks) I see things but there's no, no (lost to dog barking). They just overwhelm me. Very hard to describe. I see things that look like fruits. Very strange, I can see the seeds. I can see the (dog barks) oranges and yellows and colors. Strange. Like giant fruit.*

Son: *What is Leandros saying? What did he see?*

(Dog barks throughout this section of the recording). (Diaz says that it is hard... it is hard for him to talk. That his body feels very heavy.)

Son: *Mm-hmm.*

Diaz: *That the images are not... they are weak, no? They aren't very'... they aren't very intense, no? At times he succeeds... he succeeds in seeing some colors. He describes some flowers, and like fruit.*

Son: *Yes.*

Diaz: *But there aren't. . . there aren't images that are very... very...*

Valdes: *There are many of seeds, no? Those of melons, no?*

Son: *Si.*

Diaz: *You fee... you feel very content, no?*

Valdes: *Very heavy.*

Son: *Didn't you see anything else?*

Valdes: (sic; sounded somewhat intoxicated at this time.) *Things, but I can't describe them.*

... cross with two arms. ..it seems to be burning, no? That it bar two rays instead of one, no?

Son: *Mm-hmm.*

Valdes: *This thing seems to have fire.*

Son: *Mm-hmm.*

Valdes: (dog barked throughout) *That there is like a wrapped body.*

Son: *Mm-hmm.*

Valdes: (dogs barked throughout) *Of a cross. Now, (lost to dogs) now there were many things but now they are disappearing. Everything is like a very black...*

Son: *Si.*

Valdes: *It looks like a picture, but everything in black and white.*

Son: *Mm-hmm.*

Diaz: *I saw, I saw something like the flower of the... the newer of the... of the seed of the Virgin. Buite clearly with its purplish color. I... Ipomea violacea, no? I see many, many images if... if I concentrate on them, no? They move a lot, no?*

Son: *Si.*

Diaz: *However the... the state of feeling content left me a while ago.*

Son: *Mm-hmm.*

(the dog quieted down for a while)

Son: *Can my Father explain now?*

Diaz: *Yes. Look, I had. .. I think it is.. . it is also important that you tell him that. .. that he shouldn't feel bad because, because we... didn't... didn't see what he saw...*

Son: *Mm-hmm*

Diaz: *...exactly, because we come from. . . from a very different manner of... of looking at things, no?*

Son: *Mm-hmm.*

Diaz: *Then, because of this we have more difficulties in order to... in order to put ourselves in... in contact with Christ.*

Son: *With Christ.*

Diaz: *And with sacred things, no?*

Son: *Mm-hmm.*

Diaz: *To us... to us other things happen, no? He shouldn't see this as a failure, no? Yours or even less, of the plant, no?*

Son: *Mm-hmm.*

Diaz: *Only it's that our experience is very different because.. . well, we see things differently, no?*

Son: *Si.*

Diaz: *It is important for him that... for you both that you understand this, no?*

Son: *Mm-hmm.*

Diaz: *I feel very content, no? For... for the experience just as it is, no?*

Son: *Si.*

Diaz: *Well, that's all.*

Son: *You, Leandros, do you see more images? Or is that all you have seen?*

Valdes: *I see images and they look a little but... like the images of the church but they don't have faces, no?*

Son: *Mm-hmm.*

Valdes: *They have... one sees this, their clothing, no? Of, of gold and everything but there is no image. There aren't any faces, no? That one recognized the...*

Son: *Mm-hmmm.*

Valdes: *(lost; figures were praying) They have their hands like this... like the...*

Son: *Is that all you saw?*

Valdes: *I am looking at it now. I still... still am looking at it.*

Diaz: *I continue to see, if I pay attention I continue seeing images.)*

Son: *Mm-hmm.*

Diaz: *Like flowers again, very luminous, no? As if they had an interior light.*

Son: *Si.*

Diaz: *I think it has a lot to do with the... with the Heaven that.. . that you described to us a while ago, no? Of how Heaven is.*

Son: *Mm-hmm.*

Diaz: *Full of music. Full of flowers, no?*

Valdes: *I see something between... between a cross and a sword which is all covered with gold, very... it has many jewels.*

Son: *Mm-hmm... Do all the images continue, or is it still there?*

Valdes: *Yes, yes, it... it continues, it continues. But it changes, no? It continues and it changes, no?*

Son: *Si.*

Valdes: *Now it is.. . now it is surely a sword. .. Now it has disappeared.*

Diaz: *Now I raw like a light...like a light. These, these flowers that I said had like a. . . like*

very illuminated in the middle. Now it has changed into a light. . . strong, no?

Son: *Mm-hmm.*

Diaz: *Which comes as though from above.*

Valdes: *(lost to truck noise)... It is...is a shape between a cross but it has everything inside. It has everything... lights and animals.. . of... of people, of plants. Everything. ...of many colors, like a picture.Very, very vivid colors. Of animals.*

Valdes: *...to collect this. .: this image of a cross I could seem to be able to, when I really concentrate on it, pull It back out. It disappears and recedes into the things around it, and if I'd lose it in. . . in all the things that are happening. But if I work at it I can concentrate and bring it back It's that I can..; I, I lose the image of the crews. But if I think about this thing, it comes back to me again, no?*

Son: *Si.*

Valdes: *It returns to me again and I can pay attention to it and concentrate on it. But it is fairly difficult. But that. . . one can. . . maintain this thing. I think that's something about this state that you learn to work around in. Pull images out as you need them.*

Diaz: *...images of... like flying from a certain...*

(lost to noise) Of... of flying as though at a certain altitude. And there are like fields planted with. . . and full of plants. Planted with all the plants that produce... produce grain that if used for food. Fields that are very, well cared for.

Valdes: *"tilted on its side"? (dog starts again) ...which seems to be between a castle, or like a... a Byzantine church. I'm quite far from this thing. Not at its side, no? It isn't as it should be. It seems to be a little, how does one say, "tilted on its side"? I, am very far away and as though I'm very high above this thing. Now it looks more like a castle. I see it from the... from very far away as though it is from there. As though it is below me. But I don't see anybody of peo. . . of people. There isn't anybody. There are banners. Of all colors.*

Diaz: *That's interesting. When you mentioned a castle I also began to see one.*

Son: *A castle.*

Valdes: *"just covered by robes"? Still. . . I still see it. I see like shadows, shapes, but they don't have... I don't see faces on there things, no? They are like... how does one say, "covered by robes"? They make... and march but these things are very, very serious.*

Son: Is that all you see?

Valdes: I'm still looking at it, no? This thing is new to me. This thing.

Fifty minutes had elapsed. The curandero's Son cut the session short, saying; that the village noises, especially the dogs, were too loud for worthwhile experiences. As Diaz and Valdes left the bedroom they staggered and stumbled. Although they said their minds felt clear, the tape recording showed their speech to be slurred and their sentence patterns to be awkward and broken. Diaz commented, "It is as though the body is intoxicated (borracho) and the mind isn't." Don Alejandro spent the next hour discussing their visions in detail with them, saying that with more experience what they saw would become clearer and more meaningful. He told the visitors that Paul should drive when they left, as the effects of la Maria would last the entire night.

As the car traveled through the late Oaxacan darkness, Valdes saw more. icon-like images. Among them was the Virgin of Guadalupe amidst red, white and green streaming banners. Whenever the vision began to fade, he found that he could recall it at will. Arriving at their destination, the three researchers ate a light meal. Diaz wrapped himself in a sarope (poncho), for he had a chill. He remarked that this had happened to him on previous occasions when he had taken the Salvia infusion. His heart rate, when measured by Paul, had slowed from its normal 60 beats per minute to about however, he found himself standing in a bizarre, colored landscape talking subjects eyes and both had a normal pupillary response. Valdes felt "heavy" and "sore", especially in the shoulders and upper arms. After a shower, all went to bed.

When the lights went out (about 23:30 h or 2.5 h after ingestion of la Maria), Valdes began to have more visions. He saw a purplish light that changed into a bee or mothlike shape which became a pulsating sea anemone. The imagery expanded into a desert landscape full of moving prickly pear (*Opuntia* spp.) shapes. During the first session the previous summer and throughout this evening Valdes felt the visions appeared to be like looking at a cross between a moving cartoon and a silent motion picture. Suddenly, however, he found himself standing in a bizarre, colored landscape talking to a man who was either shaking or holding on to his hand. Next to them was something that resembled the skeleton of a giant stick-model airplane made from rainbow colored inner tubing. The "reality" of what he was seeing amazed him. After a brief instant the desert scene reappeared and Valdes then slowly drifted off to sleep. The three researchers rose early the next morning and all were in good spirits.

Discussion and conclusions: ethnopharmacology of *S. divinorum*

Remedial uses

It is beyond the scope of this paper to comment on the efficacy of *S. divinorum* in treatment of the

various "folk ailments". There is not enough information available to make a scientific decision. More fieldwork at this stage would be more practical and certainly much more useful than trying to screen for anti-inflammatory, cathartic, analgesic, diuretic, tonic and magical properties in the laboratory. However, it should be noted that many *Salvia* species are used medicinally throughout the world, and the genus name itself comes from the Latin *salvare*, to save. The middle English name for sage was *save* or *saue*, from the Latin *Salvia* via Old English *saluie* (Oxford English Dictionary, 1971), and Chaucer mentions it as a cure for wounds and broken limbs in "The Knightes Tale" (Chaucer, 1927). Common sage, *S. officinalis*, and Clary sage, *S. sclarea*, have had a long history of use in treatment of numerous maladies (Grieve, 1911). *S. miltiorrhiza*, or *ton-shen*, is one of the five astral remedies in Chinese medicine as is *jen-shen*, or ginseng (*Panax* spp.). This sage is credited with many tonic properties in the *Pen Ts'ao*, published in 1578 (Smith and Stuart, 1973), and is listed in "A Barefoot Doctor's Manual" (Anon., 1974). Siri Altschul has collected information on a number of medicinal *Salvias* from specimens at the Harvard herbaria (Altschul, 1973) and Diaz lists nine species as being used medicinally in Mexico (Diaz, 1976).

Use in divination

During the two sessions with *S. divinorum*, the investigators noted the following:

1. Various sensations were reported by the subjects while lying or sitting down in quiet darkness. These included flying or floating and traveling through "space", twisting and spinning, heaviness or lightness of the body and "soreness".
2. Physical effects also accompanied the experience. There was an intoxication that produced dizziness and a lack of coordination on trying to move about. The recording of the second session revealed slurred speech and awkward sentence patterns. Diaz had a decrease in heart rate accompanied by a chill. Both subjects had a normal pupillary response to a light shined into their eyes.
3. Even though the subjects were aware of the sensations and the physical incoordination produced by the *Salvia* infusion, they claimed their minds seemed to be in a state of acute awareness. The experience was not like intoxication from alcoholic beverages.
4. Previous reports of *S. divinorum* ingestion emphasized the mildness of its effects, and the shortness of their duration. It has been shown, however, that under the appropriate conditions of quiet and darkness it, was possible to experience effects which lasted for hours. The visions produced were readily terminated by noise or light.
5. There is apparently an aspect of the *Salvia* intoxication that leaves the subject's mind in a receptive state. This was well documented in the second session when both subjects spoke out fairly continuously. Diaz began by describing plants and flowers. After he finished speaking Valdes began with a similar vision. When Diaz lamented his inability to see the religious figures as described by the curandero, he apparently triggered off Valdes, who saw such imagery for the rest of the session and during the ride in the car. As Valdes described a castle, Diaz began to see one also. Don Alejandro's son translated the shaman's explanation of how *S. divinorum* worked in humans:

What happens to the i-nyi-ma-no (the soul, the heart or life, all three concepts are contained in a single Mazatec word) when one drinks the Maria is that the Maria has so much liquor (licor) that one is left as in a faint. For this reason a person becomes intoxicated (borracho) when they have been entered by the Maria, the oration my father prays and the words of Christ, also. But it really isn't liquor, I tell you, you go into a "delicate" state (delicado vayas). Do not worry, do not be afraid of what is happening to the i-nyi-ma-no; something does happen. but it is small and unimportant. At times one who takes the Maria becomes half-drunk but with the result that what they are taking will be engraved on their mind.

Among Mazatec healers who use the three divinatory plants (the mushrooms, the morning glory seeds and the Salvia), S. divinorum is the first to be employed in shamanic training. Leary and Alpert have been credited with being the first to discover the importance of what they called set ("a person's expectation of what a drug will do to him") and setting ("the environment, both physical and social, in which a drug is taken") to an individual's experiences under the influence of a hallucinogen (Wed, 1972). In traditional cultures, like that of the Mazatecs, the purpose of plants like ska Maria Pastora is to induce visions, and shamans, such as Don Alejandro, are master at the manipulation of set and setting to such ends. Although reportedly only weakly psychotropic, the Salvia infusion will induce powerful visions under the appropriate conditions. Two ritual orations, which heighten the mystery of what is to follow, are performed on the subject or apprentice, who then takes la Maria with the curandero himself. As the shaman reveals his vision in the silent darkness, the subject (whose mind has been put into a receptive state by the Maria and the ceremonial setting) is able to "see" it also. By having a sober person monitor the session any difficulties that arise will be observed, and if the experience becomes too terrifying, it can be readily terminated by a few words or producing a light. Mastering S. divinorum and learning to use the morning glory seeds before employing the mushrooms probably makes an apprenticeship much less traumatic than it would be by use of the fungi alone, in addition to giving the future shaman wider insights into the varieties of hallucinogenic experiences.

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