



A SCIENTIST'S VIEW OF MIRACLES AND MAGIC

Alexander T. Shulgin

Over the last several decades, I have given many lectures and addresses. Almost all of these have been to people with backgrounds in chemistry, pharmacology, or medicine, or to students who are intending to enter these fields. I was therefore expected to speak in chemical or pharmacological terms, using languages in which both they and I am reasonably fluent. My lecture material has always been shaped to fit a structure that was familiar.

I usually use the icons of brain, molecule, and receptor site. These are the "in" concepts in the world of pharmacology today. The description of what my research has been, what it presently is, and what I intend it to be in the future, would have to be cast in these images just to begin to open a door of communication. Normally I call heavily upon this vocabulary as a way of capturing the attention of my audience and so establishing a dialogue.

Today is different. For me, this invitation to talk to you here presents a rare opportunity to explore a different lecture format. Let me try to present my research work more in the form of the quest it really is. Let me risk using the icons of mind rather than brain, and spirituality rather than molecular structure.

HUMAN VERSUS ANIMAL MODELS

Almost all of the exploratory research that is being done today in pharmacology employs experimental animals. The use of human subjects, as

experimental vehicles for new and known drugs, is considered medically unacceptable when an animal model can serve your needs. Research can run the entire range from cultures of single cells to the behavior patterns of intact animals.

If the goal of the research is to develop a drug to produce a change, then the before-and-after of that change is usually defined by the observation of an appropriate animal model. To assay a possible antibiotic, you would normally infect an animal. To assay a painkiller, you would normally hurt an animal. Then, the process of drug development can start moving through the many complex levels of evaluation such as toxicology, patent law, administrative approval, and marketing surveys, towards its first trial in a human being who is infected or hurting.

This process becomes a bit more cloudy when the human malady cannot be demonstrated in an animal. An antidepressant would require that you know how to make an animal depressed. An antipsychotic would require that you have psychotic animals. It becomes essential that you use a euphemism for the illness. Call it something that it is not. Many of the classes of psychotropic drugs such as antidepressants or antipsychotics have been discovered from the observations of side-effects of known drugs in clinical studies. The unexpected responses indicate to the careful observer new and possibly valuable potential uses. The drug is then put into animals, their behavior patterns are observed, and an effort is made to correlate these patterns to potential human application. This animal behavior pattern can then be used to titrate totally unexplored compounds as to their potential for producing that specific psychotropic effect in man.

But there are many, many aspects of the human mind that are simply not approachable in any way at all with animal modeling. Even the word "mind" is anathema to many researchers. They will say, "Oh you mean the brain!" There is a consensus of denial of "mind pharmacology" by the scientific community. The chemistry of the mind is somehow considered outside the known medical disciplines.

I noticed an announcement at the Lawrence Berkeley Laboratory some few years ago, which said that a well known pharmacologist from NIDA would be giving an hour's seminar on "How the Psychedelic Drugs Work." I attended with great interest, as this was the area of my own curiosity, and I was looking forward to, perhaps, finding some answers to my questions. The substance of the seminar was cast in terms of rat brains, state of the art agonists, and beta-ray radiography of thin slices of tissue following the administration of labeled ligands. There was slide after slide of sections of cerebellum and cortex. Afterwards I asked him, "Shouldn't that lecture have been entitled, 'Where the Psychedelic Drugs Go?'" He admitted that that was a better title. "No

one, of course, really knows how they work."

No, they don't, since they deal with things that are not easily locatable in the rat's brain. How can one study the process of *deja vu*? Of telepathy or psi phenomena? Of memories of youth, or fear of death? What about human values that are spiritual or mystical, sacred or divine? What if a person were to find himself in a trance state? Or a near death experience, or a peak experience, or a hypnotic trance? How does one communicate with one's own unconscious? How does one explain insight or conviction? Consider the simple parallel between the sleep state (and the insistent presence of a dream world) and the awake state (and the insistent presence of a real world).

Last summer I was sitting around a campfire with some conservative friends, who assured me that they would never expose themselves to an alteration of a state of consciousness. I asked the most vehement of them, "How can you go through the night without sleeping?"

"But I sleep, of course."

"But when you go from the awake state (with no awareness of your earlier dreams) into a sleep state (with no awareness of your earlier reality) is this not exactly that? An alteration of consciousness?"

"Sure, but it is a natural and normal process."

"And so are all explorations of alterations of consciousness. Natural, normal, and very much a part of the human animal."

Not only is it natural and normal, but it is an inescapable part of our life process. It may be spontaneous, it may be induced, and it certainly will be a part of your own personal life experience. Consider the provocative description, by Vladimir Nabokov, obviously hypothetical, of the final two seconds of a man's life. The first of these two is taken up with memories. The last second is consumed by "The mysterious mental maneuver needed to pass from one state of being to another." What can be the research tool to study this inevitable alteration of consciousness? It is simpler just to deny death and turn to the study of depression and psychosis.

If, in my looseness of lecturing, I were to make a move yet further, from the arena of the mind to that of the spirit, the scientifically dedicated audience would simply get up and leave the room. Let me try the following questions. What is the biochemistry of your self-image? Where about you is God? Is there power in prayer? What is the neurochemistry of belief?

These are questions that the scientific technicians choose not to ask. Our technology today consists largely of manipulation of material things or entering keystrokes into a computer. To begin to explore these exquisitely human questions, we need tools that are just now beginning to be known and understood to reveal these answers.

THE ROLE OF TOOLMAKER

First, I must say that I truly believe that we have all of the answers to these questions right within us. It is just that we have not allowed ourselves access to them. We have not even acknowledged that they exist. The tools we need are those that would give us access to these answers. They may be processes such as meditation or dreaming. They may involve yielding to external forces through states of trance or coma. They may be in the form of materials such as certain plants or chemicals. Regardless of what vehicle is actually used, you must not lose sight of the fact that it is something that allows, not something that does.

Let me quote from the book that Ann and I wrote, on this very matter. This was my very first psychedelic experience, the swallowing of a capsule containing four hundred milligrams of mescaline sulfate. This is what convinced me that tools do exist.

The details of that day were hopelessly complex and will remain buried in my notes, but the distillation, the essence of the experience, was this. I saw the world that presented itself in several guises. It had a marvel of color that was, for me, without precedent, for I had never particularly noticed the world of color. The rainbow had always provided me with all the hues I could respond to. Here, suddenly I had hundreds of nuances of color which were new to me, and which I have never, even today, forgotten. The world was also marvelous in its detail. I could see the intimate structure of a bee putting something into a sack on its hind leg to take to its hive and yet I was completely at peace with the bee's closeness to my face. The world was a wonder of interpretive insight. I saw people as caricatures which revealed both their pains and their hopes, and they seemed not to mind my seeing them that way. More than anything else the world amazed me, in that I saw it as I had when I was a child. I had forgotten the beauty and the magic and the knowingness of it and me. I was in familiar territory, a space wherein I had once roamed as an immortal explorer, and I was recalling everything that had been authentically known to me then, and which I had abandoned, then forgotten, with my coming of age. Like the touchstone that recalls a dream to sudden presence, this experience reaffirmed a miracle of excitement that I had known in my childhood but had been pressured

to forget. The most compelling insight of that day was that this awesome recall had been brought about by a fraction of a gram of a white solid, but that in no way whatsoever could it be argued that these memories had been contained within the white solid. Everything I had recognized came from the depths of my memory and my psyche. I understood that our entire universe is contained in the mind and the spirit. We may choose not to find access to it, we may even deny its existence, but it is indeed there inside us, and there are chemicals that can catalyze its availability.

There is a term in the sciences for something that allows something to occur, without a one-to-one correspondence. Something that promotes something happening, but does not become part of the result. It is called a catalyst.

To me that day with mescaline still lives vividly in my memory. It was a day that confirmed the direction my life would take. Here was a simple material, the active component of a plant that has been used for countless years by countless people, for their own very personal needs. Those needs can be of many types. Some will find mescaline, or peyote, an entertaining experience, with colors and motions of no profound value. Perhaps it might play for them a role of allowing a brief escape from the mundane or tedious. Others may participate in such use as a social vehicle, allowing interpersonal activities to be enhanced and opened up. This use can be extended to the role of information seeking, such as the search for the origins and explanations of illness or of sadness. But to me that day, as I know it has been with others, I found it to be the key to a magical discovery of my own, personal spirituality. If this plain-looking white solid could play the role of being a catalyst, giving understanding of some part of the mind, what other materials could be created that might serve parallel roles?

I know that I have the art of the chemist in my hands, and I have the curiosity needed to explore this miraculous world of the mind. My role has evolved into that of conceiving, synthesizing, and personally evaluating new drugs that might alter the state of consciousness of man. In short, I have spent some 35 years inventing materials that can briefly and reversibly change a person's mental state.

I see myself as a toolmaker. I found it an exciting challenge to enter into the search for new and different catalysts. Many of the compounds that came from this search were inactive. Some were stimulants. One became an anti-depressant and saw extensive clinical studies in a large pharmaceutical house. Some had toxic side effects. But some were magical catalysts, and many of them seemed to open the door to the unconscious.

I had hoped that some overall understanding of what was happening might come from studying the relationship between the molecule and what it allowed to occur. I have yet to make any sense from that correlation. Others, as curious as I, have added their input, and we all have the optimistic hope that it will come into focus, some day. As I said, the answers are all up there in the mind – it is just that we still do not yet have much access to them.

CHEMISTRY OF GOD

But what does all of this, you might ask, have to do with churches and religion? Everything. You may have noticed that I have avoided using either of the two words, church or religion. I have the same vague discomfort about churches, and their function, that many people have about drugs. Many view the church as an entertaining experience with music and ritual but providing no profound value. To others, participation in church functions is used as a social vehicle allowing interpersonal activities to be enhanced and opened up. And yet to some, the relationship with a church offers precious insights and can provide the key to magical discoveries and personal spirituality.

It is just this quest, the search for understanding oneself, that defines, in my eyes, a religion. It is an inward quest, one that asks questions and seeks answers. I hope I do not offend too many, when I say that I believe that faith has nothing to do with true religion. The expression of faith is a statement of acceptance, acceptance of a system that is not of your own making. It is the placing of yourself in the hands of someone else, who might be anyone from a minister or rabbi to a Jesus or a Buddha.

As I continue my own personal search for my God, I am becoming increasingly convinced that He lies within me somewhere. Perhaps each person's own God lies within him; this is the meaning of the word *entheogen*. And if that internal God is the same God for all people, then we are all, in a sense, the same person. Perhaps the role of a sacrament in any religious practice has been, and is, to let a moment's light be shed on that part of reality. There is a remarkable congruity between changes of states of consciousness, religious experiences, mystical experiences, and personal miracles.

WHAT IS IN THE FUTURE?

It would be of the greatest value to humankind if these promising hints of synthesis between the body and the spirit could be pursued and extended. But I fear that in our present culture this may not be the way that things can develop.

Again, speaking as a chemist and explorer, I remember my earliest introduction to the thrill of the test-tube. I had a Gilbert Chemistry Set in the basement of my home in Berkeley. It had remarkable things in it, like logwood and bicarbonate of soda. I could make things fizz, and there was even an occasional controlled explosion. I would go down to the University Apparatus Company on McGee street, and they would happily give me new things that had remarkable names, usually for free, and I would avidly read up on their properties from books that I accumulated as fast as I could. That basement was a smelly and magical place for me.

How many people who have enjoyed their lives as creative scientists have had their starts as mavericks in some rich learning environment such as this? I fear that this type of introduction cannot be repeated in our present generation. Today, the presence of a "basement" smelling of strange chemicals would be seen as a drug laboratory, or as an environmental hazard, or as being in some other way socially unacceptable. Today, no one would sell, let alone give, a chemical to a child. Even adults can no longer buy chemicals from the major supply houses; most will only sell to businesses. In several states, one cannot even buy a beaker or glass tubing without a state permit in hand.

And there has been an avalanche of other legal impediments to these forms of free behavior. The laws have robbed us of all the sacred materials that might be used for sacramental purposes. And robbed us of the right to explore new and unknown materials that might have potential sacred properties. The enactment of the analog substances law has made it a crime to explore any substance that might be a catalyst in opening a door to one's own psyche. The chemical induction of a change of one's state of consciousness is now illegal.

I feel saddened that what little work is being done, in our culture at least, is underground. Much of it will never be made public and will remain unavailable. It therefore cannot become part of a research process that I feel is absolutely essential for the development of humanity.

But let me close on a somewhat more upbeat note. A synthesis of religion and pharmacology lies just below the surface of this meeting. This union must be explored, with the acceptance of the personal right to believe as one chooses.

There must come a parallel acknowledgment of the individual's right to explore his own mind as he chooses. This meeting just may lay the groundwork for starting the search for a solution to this dilemma.