



Timothy Scully, PhD

Tim Scully won honorable mention in the San Francisco Bay Area science fair for the design and construction of a small computer at age 14. At age 16 (after his junior year in HS), he was admitted as an undergraduate by examination to study math and physics at UC Berkeley. At the same time he worked as a lab assistant at the Lawrence Berkeley Laboratory. He dropped out to travel with Ken Kesey and the *Acid Test*, doing electronics for the Grateful Dead followed by several years as an underground chemist. In the 1970s–1980s he designed unique biofeedback instruments and computerized physiological monitoring systems for Aquarius Electronics and Mendocino Microcomputers, taking a few years out to serve a term at McNeil Island Penitentiary for his work making LSD in the 1960s. While in prison, he worked as the prison psychologist's research assistant, and designed a communication system for the non-vocal handicapped, and was named "Outstanding Young Man of the Year" by the Washington State JAYCEES. In 1979, he received his PhD in psychology from Saybrook Graduate School, based on his analysis of physiological patterns and events in consciousness. In 1980, he was appointed Assistant Research Psychologist II at UC SF Langley Porter Institute in Dr Joe Kamiya's lab. He designed computerized physiological monitoring systems and wrote software for education. Between 1987 and 2005 he was a senior software developer for Autodesk, Inc., until retiring. He holds two US patents: 1] Unique software 2] A biofeedback instrument. He is now researching and writing about the history of underground LSD manufacturing.

SOME ANECDOTES REGARDING LSD, BIOFEEDBACK AND CONSCIOUSNESS

Tim Scully

I was initially given the topic "LSD and paranormal phenomena" when I was asked to write something for this collection, but I only have a few 40-year-old anecdotes relevant to that subject.

Since then the focus of this book broadened and I was asked to also explain a bit about why I manufactured LSD for a few years during the 1960s and how that work segued into designing and making biofeedback instruments in the 1970s and 1980s.

In 1960, because of my intense interest in science, the University of California Berkeley Lawrence Radiation Laboratory hired me as a lab assistant when I was 16 years old. In 1961 I was admitted to UC Berkeley as an undergraduate student (by examination at the end of my junior year of high school) to study math and physics.

I was drawn to work at the Radiation Lab and to study physics because I hoped to help find the solution to controlled fusion, which would provide cheap and abundant power for everyone. Though I learned a lot at the Radiation Lab, I was somewhat discouraged by some of the tales of woe from graduate students at the lab. Because I was working my way through college, I started also doing electronic consulting work which grew so successful that I eventually left the Radiation Lab to spend more time with the better paying work doing electronic design consulting.

Between 1963 and early 1965 I was employed by Atomic Laboratories Inc. as electronics design consultant, where I designed radiation detection and measurement systems and various other instruments for educational applications. This work grew so intense that I took time off from studying math and physics in 1964 to work full time.

After a few years at UC Berkeley and exposure to the turbulent political debates there, I began to be more concerned that our rapid progress in technology was outstripping our ability to make wise choices in its use. Meanwhile, a childhood friend was studying oriental philosophy. He interested me in the Tao Te Ching (1) and Aldous Huxley's writings about psychedelic drugs. (2, 3) I was fascinated by the idea of expanded states of consciousness and wondered if they might help us to make better choices.

When I first took LSD in April 1965, I was captivated by the numinosity of the LSD experience. For a while I felt at one with the universe. From that time on I was much more sensitive to the beauty of the world around me and to the feelings of others around me. I wanted to share this peak experience with everyone, and I believed that if enough people took LSD, the world would change for the better. This was a fairly common belief among people who took LSD. (4) For many of us the experience was religious. (5) The psychedelic experience usually included a very deep sense of oneness with everyone and with the natural world. Because of this I thought LSD might help end racial and sexual discrimination, promote environmental consciousness and temper rampant consumerism in addition to promoting spiritual awareness. I also hoped it might bring an end to the Vietnam War. I wasn't thinking in terms of promoting paranormal experiences.

I wanted to make LSD and give it away. When I researched the problems involved in making enough LSD to turn on the world, I rapidly learned that Bear (Owsley) Stanley had both the know-how and a substantial amount of the essential raw material, lysergic acid. In late 1965 I became interested in working as his apprentice. At the time he had become fascinated by the Grateful Dead and Ken Kesey's Acid Test. (24) He offered me a job doing electronics work for the Grateful Dead while they traveled with the Acid Test. I looked on this work as an extended job interview for the position of sorcerer's apprentice. For several months in the first half of 1966 I lived and traveled with Bear Stanley and the band while doing electronics work on their sound system.

During that time I had quite a few paranormal experiences, always associated with times when we took LSD together. These included several intense "gestalt mind" experiences that went far beyond the sense of oneness associated with most LSD experiences, one event that appeared at the time to be psychokinetic and several experiences of "conventional" telepathy.

In 1966 the Grateful Dead household took LSD frequently, often (at Acid Tests) with the Pranksters who made up the remainder of the Acid Test troupe. Many of the people in the group had read *More than Human* by Theodore Sturgeon. (6) This science fiction novel describes a group of outcast and seemingly defective youngsters who have paranormal abilities such as telepathy and telekinesis. Individually they can barely survive in the world but when they are together they form a gestalt entity much greater than the sum of their parts.

Sometimes when the Pranksters and Dead took acid together and the Dead played, it felt to us as though a similar gestalt organism was formed, including many of the Dead, Pranksters and other folks who came to the Acid Test to get high with us. The intensity of this experience varied from

mild to very strong. In its strongest form, we experienced a single consciousness, which could use any of the group's bodies. The experiences lasted for an hour or more at a time.

In Sturgeon's story, the group of kids could tell that there were still some essential parts of their gestalt being that were missing. They searched for recruits to fill in the missing pieces.

Likewise, one of the reasons for Acid Tests was for the group to get high with lots of people to find missing parts of the gestalt that sometimes formed. One joke was that we'd all leave the planet together when we found the right people.

When the Dead and Pranksters parted ways, the gestalt phenomenon wasn't discussed much any longer, but we discovered that it still happened, at least to some extent, when the Dead played while taking acid and the audience was stoned too. This may have contributed to the intense sense of community, which developed among Deadheads. (7)

I can recall one incident that took place at an Acid Test in Los Angeles in 1966, which we believed at the time to be psychokinetic. The group was "linked up" in the group mind described above. (8) The Grateful Dead were playing. The band used large Altec Lansing theatre speakers at the time. These included exponential horns for the mid-range sounds. At one Acid Test one or more of the "drivers" for the exponential horns exploded (in a small way) at the same time when the group experienced a jolt of energy. Looking back, it seems impossible to assign cause and effect, but at the time we thought it was a psychokinetic effect.

I had several experiences of telepathy (distinct from the "gestalt" group mind mentioned above) where I was the sender (during an LSD experience) and Jean Millay was the receiver. In one case I was in Berkeley and Jean was in Southern California. I took LSD with a small group of friends and we had an event-filled experience. Jean telephoned me the next morning and described some of the events we experienced, from her telepathic impressions, unprompted by me or anyone else.

My overall impression is that paranormal abilities may be amplified or facilitated during LSD experiences. But investigating this possibility would present many challenges to researchers. (9)

After Bear Stanley decided that I had passed the *Acid Test*, he took me on as an apprentice in a lab he set up in Pt. Richmond. We worked there in the fall of 1966 making LSD, which was eventually distributed as *White Lightning*. From the fall of 1966 through 1968 the psychedelic scene in the Bay Area flowered, producing art, music, spirituality and social innovation. (10) Forty years later, scientific studies of the social impact of the Grateful Dead are still being conducted and presented at an annual conference of the *Grateful Dead Caucus*, and published in *The Grateful Dead in Concert: Essays on Live Improvisation*. (11, 12)

Nobel laureate in chemistry Kary B. Mullis, PhD, told the audience at the Third International Conference on Entheobotany: (13)

...I was at Berkeley and taking acid every week. That's what people did for entertainment: drink beer or go out into Tilden Park and take 500 micrograms of LSD and sit all day thinking about the universe, time going backward and forward....

Even in early 1966 there were sensational reports in the popular press about the dangers of taking LSD in a nonmedical setting. (14, 15) Why did I, and most young people experimenting with LSD, ignore or discount these reports?

One answer is that many LSD users also smoked marijuana and were aware of wildly inaccurate reports of the dangers (e.g., *Reefer Madness*) of marijuana dating back to Harry Anslinger's years as Commissioner of the Federal Bureau of Narcotics. (16) Another answer might be the disparity between our own experiences, the reports of friends who used LSD and the sensational press reports.

Over time this credibility gap grew wider and wider as new myths were reported and then debunked. (17) A series of reports claimed that LSD caused chromosome damage and caused women to have deformed babies. This also proved to be false. (18, 19, 20)

The vast majority of people had very positive experiences with LSD. (21, 22) With the help of selective attention, it was easy to see only the positive effects of LSD and to overlook the negative ones.

Because LSD was banned, it was pushed into the same distribution channels as other illegal drugs.*³ (23) Anti-drug legislation and propaganda made no real distinction between psychedelics and hard narcotics, (24) encouraging young people to become color blind to the distinctions among drugs, with often-tragic results. All too many young people decided that, considering their experiences with LSD and marijuana, the other "dangerous drugs" were probably not very dangerous and were worth a try. This was a fatal error for some people. Even among the people who only took psychedelics some very bad trips and a few deaths occurred. (25)

In recent years I've been researching the history of underground LSD manufacturing, learning about many different underground chemists and I think it is safe to say that *making* LSD is often addictive. The work brought with it a sense of great significance; most of us believed that we were trying to save the world. At the same time, it conferred high social status among young people, including beautiful women. For some people, the money involved was also an increasingly significant factor.

*³ Possession, sale or manufacture of LSD became illegal in California in October 1966.

By mid 1970 I had worked in several LSD labs, was in serious legal trouble and under heavy surveillance likely to lead to still more legal woes. At the same time, I was finally beginning to doubt that making LSD widely available was the panacea it had seemed to be. I still believed that extraordinary states of consciousness could be highly beneficial, but I wanted to find a more socially acceptable technology for achieving them.

I was aware of studies that associated unusually copious alpha brainwave patterns with Yoga and Zen masters (26, 27) and of research that had been done with brainwave biofeedback, teaching people to control alpha brainwave production (28) and I'd been a subject in one of Barbara Brown's early studies on EEG. (29) This led me to explore brainwave biofeedback as an alternative to psychedelic drugs. I was able to transfer some of my fervor for turning the world on with LSD to turning on with alpha brainwaves.

By 1971 I was working full time running Aquarius Electronics, making simple EEG biofeedback instruments. These were initially used mainly by people seeking to produce more alpha brainwaves with the goal of rapidly achieving meditative states. (30) It slowly became clear that although a large number of people did find single channel EEG biofeedback to be an aid to meditation, many others found that it was possible to produce lots of single channel alpha without a calm mind.

As a result of suggestions from Jean Millay, I designed a two-channel brainwave comparator in late 1973. It was configurable to train for coherence (both channels close to the same dominant EEG frequency) or phase synchronization (in addition to coherence, the two channels are close to zero degrees phase angle). (31) The first instrument was completed while I was in prison for my work in the 1960s. Millay used it to experiment with interpersonal EEG synchronization and interhemispheric EEG synchronization. (32, 33) Later, Johnston adjusted the program for the PDP 13 computers at Kamiya's Psychophysiology Lab at UCSF Langley Porter, in order to continue the experiment where EEG chart recorders were available. (34) (See also Chapter 22 – James Johnston's *Brainwave Synchronization: A Pilot Study*.) In 1977, Tod Mikuriya, MD, used our phase comparator to provide biofeedback training in bilateral synchronization with his schizophrenic patients, who then developed more voluntary control over attacks of anxiety. (35)

We learned that bilateral phase synchronized alpha was much more reliably associated with meditative states. This started me down the path to explore physiological patterns and eventually led to the topic of my PhD dissertation, *The Analysis of Physiological Patterns Associated with Events in Consciousness*. (36)

REFERENCES AND NOTES

- 1) Lao Tzu. (Ancient) *The Tao Te Ching*. Various translations, including:
 - A) Mitchell, S. (1988) *Tao Te Ching: A New English Version with Foreword and Notes*. NY: Harper & Row Publishers. (Translation, 1943.)
 - B) Frank J. MacHovcc. (1962) *The Book of Tao: The Key to the Mastery of Life*. Mount Vernon, NY: The Peter Pauper Press.
- 2) Huxley, A. (1963) *Doors of Perception & Heaven and Hell*. NY: Harper & Row.
- 3) Huxley, A. (1962) *Island*. London: Chatto & Windus.
- 4) Ungerleider, J. Thomas & Fisher, Duke D. (1967) "LSD today." In: *Medical Digest*, 1967, 13, 33-37, 40-42.
- 5) Pahnke, Walter N. (1967). "LSD and religious experience." In: *LSD, Man and Society*, DeBold, R.C & Leaf, R.C. (Eds.) Middletown, CN: Wesleyan University Press.
- 6) Sturgeon, T. (1953) *More than Human*. NY, NY: Ballantine Books.
- 7) Adams, R.A. & Sardiello, R. (Eds.) (2000) *Deadhead Social Science*. Lanham, MD: Rowman Altmira.
- 8) Douglas, D. (Excerpts from his poem about the Grateful Dead.)

"A Sign of Greeting"

...It calls up free playin' down on Haight Street, where they
had 'em dancin' on the rooftops... dancing from the telephone
poles, anything they could find.

There were free flowin' bodies in motion, it looked like a human ocean
and the Bear got 'em all connected up among their minds.

But that's long before the turtles danced down at the train tracks
'yeah, but even the band was dancin' out in the street.

That scullbone lightning yet to come from Thomas' hand
and only Jerry gave the wave
as a sign of greeting

I saw more people manning concessions
than they used to have comin' to the dances.

They'd stop the traffic on the freeway 'bout every time they'd hold a show.
Some called 'em 'longest living relics,' a reminder of a high time that passed,
and others called 'em 'harbingers of a higher time to come.'

And in their world the turtles danced down at the train tracks
yes, and the people danced out in the streets...

- 9) Luke, D. & Kittenis, M. "A preliminary survey of paranormal experiences with psychoactive drugs." In: *The Journal of Parapsychology*
- 10) Lee, M.A, Shlain, B. (1985) *ACID Dreams: The Complete Social History of LSD: The CIA, The Sixties, and Beyond*. NY: Grove Weidenfeld.
- 11) Spector, S. & Tuedio, J. (2009) *The Grateful Dead in Concert: Essays on Live Improvisation*. CA: McFarland Publishers.
- 12) The *Grateful Dead Caucus* has met annually as part of the Southwest/Texas American/Popular Culture Association Conference in Albuquerque, New Mexico. Members of the Caucus represent a wide variety of disciplines, which they claim are not multidisciplinary, cross-disciplinary, nor interdisciplinary, but transdisciplinary — representing a discipline of its own.
- 13) Mullis, K.B. "The great gene machine." In: *Omni* April 1993. (Interviewer Liversibge, A.)
- 14) "The dangers of LSD." In: *Time*, April 22, 1966.

- 15) "The exploding threat of the mind drug that got out of control: LSD." In: *LIFE*. March, 1966.
- 16) Grinspoon, L. (1994) "Marijuana reconsidered." In: *Quick American Archives*, Oakland, CA.
- 17) <http://www.snopes.com/horrors/drugs/lsd/sun.asp>.
- 18) Cohen, M.M., Marinello, M.J. & Back, N. (1967) "Chromosomal damage in human leukocytes induced by lysergic acid diethylamide." In: *Science*, 1967; 155:1417-19. LSD #1506.
- 19) Davidson, B. (1967) "The hidden evils of LSD." In: *Saturday Evening Post*, Aug 12, 1967, p. 19.
- 20) Grof, S. (1980-1994) "The effects of LSD on chromosomes, genetic mutation, fetal development and malignancy." In: Appendix II of *LSD Psychotherapy*. Alameda, CA: Hunter House Publishers.
- 21) Grof, S. (1976) *Realms of Human Unconscious: Observations from LSD Research*. NY: E.P. Dutton.
- 22) Tart, C. (1969). *Altered States of Consciousness: A Book of Readings*. NY: John Wiley & Sons.
- 23) Leary, T. (1975) Excerpts from "Seeds of the Sixties." In: *Spit in the Ocean*, Kesey (Ed.)
...The inevitable backlash from this new message of individual power began in 1966 when various legislatures and Congress began considering bills to criminalize LSD and similar drugs. In this year, I testified before two Senate committees urging that control of all mind-changing drugs be assigned to the medical profession supervised by Federal and State health agencies. I predicted that if control of drugs were administered by law enforcement agencies, the result would be a black market more irrational and widespread than prohibition and the growth of enormous police-state repressive bureaucracy. And who, indeed, wanted that?
My own political position then was by no means radical or solitary. Indeed, during the Johnson administration, a bitter battle was fought on this issue. Medical and scientific people (backed by the Kennedys) urged that drugs be administered by the Department of Health, Education and Welfare while law-and-order people politicked for the Department of Justice. History may well decide that the second great, belligerent disaster of the Johnson years was the decision to turn drug control over to the police. LSD was made illegal and most of the top drug scientists began their steady exit from government responsibility. Another war on heresy had been declared....
- 24) The federal law governing LSD between 1966-1968 was Public Law 89-74, *The Drug Abuse Control Amendments of 1965*. This law lumped LSD with amphetamines and barbiturates and was enforced by the Federal Bureau of Drug Abuse Control (BDAC). In 1968 President Johnson merged the BDAC with the Bureau of Narcotics (which handled marijuana and heroin) into a new Bureau of Narcotics and Dangerous Drugs (BNDD). In California, the Bureau of Narcotics Enforcement (BNE) handled LSD along with heroin and other drugs. In 1969 the Nixon administration sent new drug legislation to Congress which established four "schedules" for drugs with Schedule 1 containing LSD, Marijuana and Heroin (an interesting grouping).
- 25) Wolfe, T. (1968) *The Electric Kool-Aid Acid Test*. NY: Farrar, Straus & Giroux.
- 26) Kasamatsu, A. & Hirai, T. (1963) "Science of Zazen." In: *Physiologica*, 6:86-91.
- 27) Anand, B., Chhina, G.S. & Shing, B. (1961) "Some aspects of electroencephalographic studies in yogis." In: *EEG Clin Neurophysiol*. 13; 452-456. Reprinted in *Altered States of Consciousness*, Charles Tart (Ed.) John Wiley and Sons, 1969.

- 28) Kamiya, J. (1969) "Operant control of the EEG alpha rhythm and some of its reported effects on consciousness." In: *Altered States of Consciousness: A Book of Readings*. Tart, C.T. (Ed.) NY: John Wiley & Sons.
- 29) Brown, B. (1974) *New Mind, New Body*. NY: Bantam.
- 30) Zimmerman, J. (1970) "Turning on with alpha waves." In: *LIFE* 69:8 p60-61.
- 31) See Appendix B of Johnston's Chapter 22 for Scully's full technical description of the Aquarius Electronics Brainwave Analyzers and Phase-comparator.
- 32) Millay, J. (1978) *The Relationship Between Phase Synchronization of Brainwaves and Success in Attempts to Communicate Telepathically: A Pilot Study*. SF, CA: Saybrook University—Graduate College of Psychology and Humanistic Studies. (PhD dissertation)
- 33) Millay, J. (1999) *Multidimensional Mind: Remote Viewing in Hyperspace*. Berkeley, CA: A Universal Dialogues Book, North Atlantic Books.
- 34) Johnston, J.R. & Millay, J. (1983) "A pilot study in brainwave synchrony." In: *Psi Research*, Vol. 2, No. 1 March. SF, CA.
- 35) Mikuriya, T. (1977) Personal communication.
- 36) Scully, T. (1978) *The Analysis of Physiological Patterns Associated with Events in Consciousness*. SF, CA: Saybrook University—Graduate College of Psychology and Humanistic Studies. (PhD dissertation)

You don't have hallucinations with LSD. In a hallucination you see something that does not exist. But under LSD, you see things, but which are transformed. It is a different view, or a different experience of our existence.

--- **Albert Hofmann**

--- *Hofmann's Potion*

--- *Canadian Film Board*