

Ralph Abraham, Ph.D.

Mathematics and the Psychedelic Revolution

Recollections of the impact of the psychedelic revolution on the history of mathematics and my personal story.



Ralph Abraham, Ph.D.
Professor of Mathematics
University of California
at Santa Cruz
www.ralph-abraham.org
abraham@vismath.org

1. Introduction

In 1972 I met Terence McKenna and we became close friends. Ten years later we were joined by Rupert Sheldrake in a special triadic bond. We developed a habit of conversing on common interests in a style that evolved into a form we called a “dialogue,” and eventually we performed public dialogues. These occurred sporadically from 1989 until 1996. The Esalen Institute was very hospitable and helped us organize and record these dialogue events, which led to our two volumes of published dialogues. In a typical dialogue, one of us would lead off with a trigger monologue of fifteen minutes or so. My conversation starter for one of our dialogues in 1996 is the basis of the next section, on my supposed revolutionary role in the psychedelic history of mathematics in the 1960s, and the origin of chaos theory.

2. Math in the 1960s

One day I was sitting in my office with my secretary, Nina, when there was a knock on the door. Nina said, “This is a friend of a friend of mine, who wants to interview you.” I was very busy with the telephone and the correspondence, so he came inside and I answered his questions without thinking. After a month or so, when a photographer arrived, I began to realize that I had given an interview for *Gentleman’s Quarterly* (*GQ*) magazine. I called my children and asked them what was *GQ* magazine. They live in Hollywood and know about such things. I was in Italy when the magazine finally arrived on the stands. I was very proud, in spite of my style of dress, that I had been the first one in our circle of family and friends to actually be photographed for *GQ*.

But I was shocked in Firenze to open the first page of the magazine, and see my picture occupying a large part of the first page, with the table of contents, with the heading: “Abraham sells drugs to mathematicians.” There were some other

insulting things in the interview, that as far as I can remember, were largely fiction. I didn’t mention it to anybody when I came back to California, and was very pleased that nobody mentioned it. Nobody had noticed. There were one or two phone calls, and I realized that nobody after all reads *GQ*. If they do look at the pictures, they overlooked mine. I was safe after all at this dangerous pass.

Suddenly, my peace was disturbed once again by a hundred phone calls in a single day asking what did I think of the article about me in the *San Francisco Examiner*, or the *San Jose Mercury News*, and so on. All the embers in the fire left by *GQ* had flamed up again in the pen of a journalist. A woman who writes a computer column for the *San Francisco Examiner* had received in her mail box a copy of the *Gentleman’s Quarterly* article, in which Timothy Leary was quoted as saying, “The Japanese go to Burma for teak, and they go to California for novelty and creativity. Everybody knows that California has this resource thanks to

It all began
in 1967
when I was
a professor of
mathematics
at Princeton, and
one of my students
turned me on
to LSD.

psychedelics." Then the article quoted me as the supplier for the scientific renaissance in the 1960s.

This columnist didn't believe what was asserted by Timothy Leary and others in the *GQ* article, that the computer revolution and the computer graphic innovations of California had been built upon a psychedelic foundation. She set out to prove this story false. She went to Siggraph, the largest gathering of computer graphic professionals in the world, where annually somewhere in the United States 30,000 who are vitally involved in the computer revolution gather. She thought she would set this heresy to rest by conducting a sample survey, beginning her interviews at the airport the minute she stepped off the plane. By the time she got back to her desk in San Francisco she'd talked to 180 important professionals of the computer graphic field, all of whom answered yes to the question, "Do you take psychedelics, and is this important in your work?" Her column, finally syndicated in a number of newspapers again, unfortunately, or kindly, remembered me.

Shortly after this second incident in my story, I was in Hollyhock, the Esalen of the far north, on Cortes Island in British Columbia, with Rupert and other friends, and I had a kind of psychotic break in the night. I couldn't sleep and was consumed with a paranoid fantasy about this outage and what it would mean in my future career, the police at my door and so on. I knew that my fears had blown up unnecessarily, but I needed someone to talk to. The person I knew best there was Rupert. And he was very busy in counsel with various friends, but eventually I took Rupert aside and confided to him this secret, and all my fears. His response, within a day or two, was to repeat the story to everybody in Canada, assuring me that it's good to be outed. I tried thinking positively about this episode, but when I came home still felt nervous about it and said "no" to many interviews from ABC News, and the United Nations, and other people who called to check out this significant story. I did not then rise to the occasion, and so I've decided today, by popular request, to tell the truth.

It all began in 1967 when I was a professor of mathematics at Princeton, and

one of my students turned me on to LSD. That led to my moving to California a year later, and meeting at UC Santa Cruz a chemistry graduate student who was doing his Ph.D. thesis on the synthesis of DMT. He and I smoked up a large bottle of DMT in 1969, and that resulted in a kind of secret resolve, which swerved my career toward a search for the connections between mathematics and the experience of the logos, or what Terence calls "the transcendent other." This is a hyper-dimensional space full of meaning and wisdom and beauty, which feels more real than ordinary reality, and to which we have returned many times over the years, for instruction and pleasure. In the course of the next twenty years there were various steps I took to explore the connection between mathematics and the logos.

About the time that chaos theory was discovered by the scientific community, and the chaos revolution began in 1978, I apprenticed myself to a neurophysiologist and tried to construct brain models made out of the basic objects of chaos theory. I built a vibrating fluid machine to visualize vibrations in transparent media, because I felt on the basis of direct experience that the Hindu metaphor of vibrations was important and valuable. I felt that we could learn more about consciousness, communication, resonance, and the emergence of form and pattern in the physical, biological, social and intellectual worlds, through actually watching vibrations in transparent media ordinarily invisible, and making them visible. I was inspired by Hans Jenny, an amateur scientist in Switzerland, a follower of Rudolf Steiner, who had built an ingenious gadget for rendering patterns in transparent fluids visible.

About this time we discovered computer graphics in Santa Cruz, when the first affordable computer graphic terminals had appeared on the market. I started a project of teaching mathematics with computer graphics, and eventually tried to simulate the mathematical models for neurophysiology and for vibrating fluids, in computer programs with computer graphic displays. In this way evolved a new class of mathematical models called CDs, cellular dynamata. They are an especially appropriate mathematical object

By the time
she got back
to her desk in
San Francisco
she'd talked to 180
important professionals
of the computer graphic
field, all of whom
answered yes
to the question,
"Do you take
psychedelics,
and is this important
in your work?"

I did not then
rise to the occasion,
and so I've decided
today, by popular
request, to
tell the truth.

for modeling and trying to understand the brain, the mind, the visionary experience and so on. At the same time other mathematicians, some of whom may have been recipients of my gifts in the 1960s, began their own experiments with computer graphics in different places, and began to make films.

Eventually, we were able to construct machines in Santa Cruz which could simulate these mathematical models I call CDs at a reasonable speed, first slowly, and then faster and faster. And in 1989, I had a fantastic experience at the NASA Goddard Space Flight Center in Maryland, where I was given access to, at that time, the world's fastest super computer, the MPP, the Massively Parallel Processor. My CD model for the visual cortex had been programmed into this machine by the only person able to program it, and I was invited to come and view the result. Looking at the color screen of this super computer was like looking through the window at the future, and seeing an excellent memory of a DMT vision, not only proceeding apace on the screen, but also going about 100 times faster than a human experience. Under the control of knobs which I could turn at the terminal, we immediately recorded a video, which lasts for 10 minutes. It was in 1989 that I took my first look through this window.

To sum up my story, there is first of all, a 20-year evolution from my first DMT vision in 1969, to my experience with the Massively Parallel Processor vision in 1989. Following this 20-year evolution, and the recording of the video, came the story with *GQ* and the interviews at Siggraph in the *San Francisco Examiner* that essentially pose the question, "Have

psychedelics had an influence in the evolution of science, mathematics, the computer revolution, computer graphics, and so on?"

Another event, in 1990, followed the publication of a paper in the *International Journal of Bifurcations and Chaos*, when an interesting article appeared in the monthly notices of the American Mathematical Society, the largest union of research mathematicians in the world. The article totally redefined mathematics, dropping numbers and geometrical spaces as relics of history, and adopting a new definition of mathematics as the study of space/time patterns. Mathematics has been reborn, and this rebirth is an outcome of both the computer revolution and the psychedelic revolution which took place concurrently, concomitantly, cooperatively, in the 1960s. Redefining this material as an art medium, I gave a concert, played in real time with a genuine super computer, in October, 1992, in the Cathedral of Saint John the Divine, the largest Gothic cathedral in the world, in New York City.

3. Conclusion

There is no doubt that the psychedelic revolution in the 1960s had a profound effect on the history of computers and computer graphics, and of mathematics, especially the birth of post-modern maths such as chaos theory and fractal geometry. This I witnessed personally. The effect on my own history, viewed now in four decades of retrospect, was a catastrophic shift from abstract pure math to a more experimental and applied study of vibrations and forms, which continues to this day. •