

24.3. The World in a Grain of Sand

To see a world in a grain of sand,
And a heaven in a wild flower,
Hold infinity in the palm of your hand,
And eternity in an hour.

—William Blake, 1803



Shattered Dream, watercolor of a bi-wing acrobatic plane, January 1964. I longed to fly and see the world from far above. On my 10th birthday, I hired a pilot at the Midland-Odessa Airport for \$2 to take me up. After that experience, I knew that motion sickness would probably prevent me from ever becoming a pilot. But something weird and wonderful happened fourteen years later that let me put those broken pieces back again on my second flight in a small plane.

Having been raised by a scientifically-oriented father in a strict Catholic home, I was accustomed to the way grown-up people could separate spirit from matter and yet give

equal importance to both. Nevertheless, it had been my quest from the time I was in high school to resolve this dualism into a unified explanation free of blatant contradictions. In the mid-1970's, while living in Austin, Texas, I read a book by Arthur Koestler titled *The Roots of Coincidence*. This book introduced me to the term "synchronicity." This neologism, which had been first uttered publicly in 1930 by Swiss psychoanalyst Carl Jung, was coined by Jung and physicist Wolfgang Pauli and referred to meaningful coincidences. The assumption was made that there was a not-yet-understood connecting principle at work based on meaning instead of linear cause and effect. I took immediate interest because am prone to synchronicities.

A curious thing, which also relates to the phenomenon, is that after I learned that there was a word for meaningful coincidences, they began happening more often. The fact that I was looking for them was a small part of the explanation for their increase, but there was something else at work. At the time I was reading about quantum physics and how it was appearing to many physicists that nature behaved more like mind than matter. Once I was inclined to believe that mind interacted with what was perhaps unjustly accused of being called "matter," events conspired to demonstrate to me this interaction over and over. An intriguing metaphor of how this might all work in a practical way was holography. After all, it had been shown that, because of the dual nature of light, if you cut up a hologram into tiny pieces, each of the pieces would still retain the complete three-dimensional image. This was a graphic example for me that, as the mystical poet-artist William Blake so famously wrote, a world could be found in every grain of sand. There appeared to be an underlying and unifying connecting principle at work that demonstrated in a holographic universe how everything might somehow be connected to everything else.

My first serious introduction to holography occurred when I came across the Museum of Holography while making the rounds of Manhattan galleries that sold my work. It was there I got my first look at a large selection of laser-projected holograms—the most impressive being a large transmission hologram of a train car that appeared to stick out about six feet into the room. All the detail was there, in three dimensions, inside and out. I walked around the three sides and gazed in the open door on one end and could see all the seats. Looking through the passenger windows was just like peering through real glass, reflections and all. I read on one of the displays that the information of a hologram was encoded all over the entire two-

dimensional plate, so that any portion of the hologram contains the whole. If one piece of the hologram were cut out and the laser was directed through that piece, the entire image in three dimensions could still be seen rising from the flat plane of the hologram. The quality is reduced by creating smaller pieces, but the information that defines the whole is contained in every part.

This revelation struck me like a thunderbolt. I immediately saw it as a physical demonstration that the universe might also be explained as the whole being contained in all the parts. I had read Fritjof Capra's 1975 book, *The Tao of Physics*. While some of the physics was open to interpretation, it served to stir up public interest in what science might have to say about Eastern philosophy. I remembered a passage in the book about the metaphor of Indra's net of Hindu and Buddhist philosophy, which illustrates the interconnectedness of all phenomena throughout time and space. A pearl in each node of Indra's net reflects all the other pearls in the net. Capra compared this to how "particles are dynamically composed of one another in a self-consistent way, and in that sense can be said to 'contain' one another." This made sense to me based on my psychedelic experiences.

The first Star Wars film was released in May 1977. Everyone who saw the film remembers the scene showing a video hologram of Princess Leia being projected from the R2-D2 droid when she appeals to Obi-Wan Kenobi for help. The film and the holograph exhibit inspired me to write in my journal that holographic forms of art, presented in multiple sense modalities and in multiple dimensions across time, would eventually replace the kind of flat, 2-D art I was doing.

If you tear up a two-dimensional photograph, the separate pieces convey nothing of the whole. But with a hologram the information is distributed in an interference pattern on a flat surface from which three dimensions can be resurrected with light. Since the 1980s, and accelerating over the following decades, a number of theoretical physicists began thinking that Blake may have gotten it right, after all, and that the universe is a gigantic hologram. It could be that instead of the perceived three spatial dimensions, plus time, the universe is "written" on its two-dimensional boundary, like a hologram. What we call reality would actually be a hologram with the more fundamental reality being two-dimensional information, perhaps as a form of consciousness. Everything we see and experience, including time, would be something like the Sanskrit notion of *maya* (illusion).

What makes holographic reality so interesting is that every part of a hologram contains the whole, and if the universe is a hologram, every grain of sand, in some sense, also contains a (low resolution) representation of the whole universe, as does every other thing and being, ourselves included. Could this be why, in certain states of mind, we seem to find the universe within ourselves?

At the exhibit was a hologram titled, “Kiss II” by Lloyd Cross. It was a reflection hologram of a girl, viewable in ordinary light, that winked and blew a kiss as one walked by. I bought a small version of the winking, kissing girl and took it home with me to Austin. While I was busy rebuilding my house in 1977, I bought *Understanding Holography* by Michael Wenyon, and while reading the book I used the hologram as a bookmark. I still have both the book and the hologram.

After I finished the book, I called the University of Texas to see if they had a holography lab so I could observe a hologram being made. I was told to speak to Professor Arwin A. Dougal, who had been one of the pioneers in laser and holographic research in the 1960s. I wrote his number on a slip of paper where it promptly got lost in the mess of my desk and the chaos of construction.

Around noon, Easter Sunday March 26, 1978, I decided to take advantage of the beautiful spring day to go visit my youngest brother, David, who lived near Buda, a hamlet about fifteen miles southeast of Austin. David did not have a phone at the time and lived in a small, wood-frame farmhouse on farm-to-market road 2001. It was always a hit or miss proposition to catch him home. This particular time, it would be a miss. Instead of returning to Austin, I decided to go for a drive in the country with no particular destination in mind, thinking I might try him again later on the way back. I drove to highway 21 and turned left. I suffered a moment of ambivalence and stopped. I thought better of it, and turned around to head the opposite direction. As I was driving, I noticed what I thought was a bird, poised high in the sky. After I stopping the car, I could see the object was a tiny biplane doing spectacular acrobatics—barrel rolls, loop-to-loops, 180s, and hammerhead maneuvers. I thought of the Wicked Witch of the West on her broom as she spelled out “Surrender Dorothy” in the film *The Wizard of Oz*. As the plane got lower in the sky I noticed that there was a small airport across the nearby field. I drove over to the San Marcos airport, arriving just before the biplane touched down. The pilot landed and rolled his tiny aircraft up to the side of the runway, climbed out of the cockpit, and entered the airport office. I followed him in

and complimented him on his aerobatics. We introduced ourselves to each other, but I didn't quite catch his name. He said that flying was his hobby and that he was a college professor, originally from Iowa. Again, I thought of The Wizard of Oz. The professor's mid-western accent and puckish personality made me think of Professor Marvel with his gypsy wagon emblazoned with the words "past, present and future." The professor told me that the airplane was a Pitts Special, the smallest acrobatic plane in the world, and he had certainly demonstrated wizardry in the air. "What do you do?" he asked. "I'm an artist, but I always wanted to fly," I said. "Unfortunately I get airsick."

The professor rubbed his chin. "What kind of artist are you?" "I do fine art—drawing, printmaking and painting."

"What kind of painting?"

"Acrylics and oils. I work with the airbrush also."

The professor lit up. My wife's name is Peg," he said. "Will you airbrush 'Peg-of-my heart' on the cowl of my Pitts?" "I don't do that kind of airbrush work," I said, immediately feeling guilty for not granting his request. "But may I hire you for a gentle flying lesson, without the barrel rolls?"

"I'm not certified to give paid flying lessons, but I can take you up for free," he said, compounding my guilt. "Take these keys and go over to my other plane—that Cessna over there. I'll take you up and we'll see how you do."

Within minutes, we were sitting side by side in his Cessna, climbing into the sky on the beautiful Easter day. The earth was emerald green. Hundreds of stock ponds reflected the sun back towards us from the farms down below. Out of the blue, the professor suggested, "Why don't we fly down to the beach and see what the kids are doing?"

I had earlier read that a hundred thousand college students and other young people were expected to drive their cars down to the hard-packed beach for a Spring Break party that weekend, which stretched along a hundred and twenty miles of barrier Islands. Within an hour and a half we were watching the surfers catching swells from a thousand feet up. We landed at an airstrip on Mustang Island and had lunch. After we took off, buzzing the beach at a lower altitude, I saw a car that looked like my brother David's red 1966 Ford Mustang. After flying some miles down South Padre Island, and admiring the view, we turned around and came back again.

On the second pass, I still thought it might have been David's car, but I did not see David. Red Mustangs were quite common in those days, so I did not think too much of it. We flew back to San Marcos and I invited the professor to dinner. Over dinner he told me about his love for flying, and waxed poetically about his first airplane flight in 1939, from a plane that had landed in one of his father's harvested oat fields. He wrote later in a letter I still have, "The beautiful, small plane carried me aloft into the sky and part of me stayed up there. Ever since I have to ascend again and again to find that part of me."

I asked the professor what subject he taught. "Electrical engineering at the University of Texas," he said. "What's your specialty?" "My specialty is laser and holographic research," he said. I was one of the early pioneers in this work in the early Sixties."

My jaw dropped. He was Dr. Arwin A. Dougal, the very same professor whose name lay scribbled on the scrap of paper on my desk. He laughed when I told him and he said, "Well, come by next week and I'll give you a tour of the lab."

After I told him about my interest in holography, especially motion holography, the professor said that he had consulted with CBS and others about precisely this thing. "Hugh Hefner was interested in creating a holograph effect in his swimming pool grotto," he said. "As one entered the pool one would see a naked girl in the water at the other end."

"I like that idea," I said, "but not as much as having a real naked girl in my pool."

I dropped him off at the airport and headed back on Interstate 35 towards Austin. On the way back, I exited at Buda to swing by my brother's house. As I pulled in, David was standing with his friend Chuck Morphew behind the Mustang in the driveway, getting ready to open the trunk to start unloading. "Wow Michael!" David said, "What a coincidence! We just arrived this very minute!"

"You don't know the half of it," I said. "Were you just down at the beach?"

"Yeah, how did you know?"

"Did you see a Cessna buzzing the beach?"

"Yeah, it flew over twice," he said. "It was red, white and black." Well, that was me. I was looking for you!"

If the universe is a hologram, with reality coded on a distant, two-dimensional surface, then this multi-leveled occurrence might make more sense. It could be reality reflecting back on itself through its connections to other things and events, as well as the whole.¹ This self-referential aspect might have caused multiple interlocking synchronicities, what Paul Kammerer would have called a fifth-order series of coincidences:

1. Visiting the Museum of Holography and wondering if a holographic universe could explain synchronicity, mystical experiences, and other anomalous experiences. Looking up Arwin A. Dougal, a pioneer of laser and holographic research in order to contact him.
2. Going to Buda to see if my brother David was home.
3. Meeting holograph pioneer Professor Dougal in a seemingly random, remote location soon after resolving to find out more about holography by visiting him.
4. Being flown by the professor to the Texas coast, and seeing David's car on the beach.
5. Finally meeting up with my brother when both of us arrived at his home at the same time.

Besides these obvious synchronicities, there were other meaningful or mythological events of the day that further gave me the impression of being let in on a cosmic secret. The name of the place where my brother lived, Buda—a homonym of Buddha—reposing in the tranquil setting, represented the non-attachment part of my life-long ideal of passionate non-attachment. The number of the farm-to-market road, where my brother lived and which the journey began on—2001, was evocative of the well-known movie and book. *2001: A Space Odyssey* is about how we are being pulled towards a rebirth of our species through contact with other intelligent species, which could also be seen as a metaphor of our greater Self or the mergence of self-aware AI. It was also a journey taken on trust, with no particular plan in mind, which led to a demonstration of how events can interconnect backward and forward through time and space. It was Easter, which represents the rebirth of the mythical Christ—which

¹ In 1978, physicist Charles Thorn observed that string theory indicates a lower dimensional description in which gravity emerges in a holographic manner. The holographic principle was not fleshed out in depth until the 1990s by other physicists.

is analogous to the mythical awakening of the Buddha Self. The journey began and ended at my brother's house in Buda. The root of the word Buddha, buddh, means to wake up. Finally, my shattered dream to be a pilot, is represented by the crumbling watercolor I painted in 1964 of an acrobatic biplane like the one Arwin was flying above the airport. (I rediscovered this shattered drawing by accident while re-writing this chapter in 2025).

I would also later read that the colors of the Cessna—red, white and black—are the sacred colors in both Eastern and Western mythology for the threads of Fate, representing birth, life and death—or past, present and future. The Three Fates, in Greek mythology, were female spinners who wove the red, white and black threads into the fabric of our fate. In a very curious way, it seemed that the Three Fates had blown me an Easter kiss.

Or, if we give skepticism its due, it could also have just been a string of coincidences that do not mean a thing. As Plutarch once wrote (*Lives: Vol. II. Sertorius*) “It is no great wonder if in the long process of time, while fortune takes her course hither and thither, numerous coincidences should spontaneously occur.” Indeed, if this was the only series of coincidences to ever befall me, I would be more inclined to dismiss it as my father would have. I do not think anything metaphysical happened, but I assume there was a physical explanation, even if it is not yet understood.

I visited Professor Dougal in his lab at the University of Texas soon after our meeting and got my first physical demonstration of how a hologram is made. He explained how a laser beam is split by a half-silvered mirror. Each of the two beams is then put through a diffusing filter. The light from the reference beam then proceeds directly to a flat photographic plate that is coated with photo-emulsion. The hologram records patterns of light that look just like the ripples that will radiate outwards from a tossed rock in a still pond.

The other beam is scattered by the diffusion filter over the object to be photographed and this information is carried in light waves to the same photographic plate. Like more rocks being tossed into the pond, all the competing ripples form a complex pattern that is instantly frozen into place. The diffused, information-bearing light from the second beam hits the plate and creates a standing interference pattern that is then recorded. It is for this reason the whole apparatus must be kept very still, and why it is so difficult to make motion holograms.

The professor was straight out of the *Wizard of Oz*, especially with the account of his first flight in 1939, the year that the movie version was released. The professor was the exemplar of the search outside myself for what lay inside all along. Also, flying fantasies for me were always the escape from old established patterns, which was part of my childhood fascination with airplanes. The midwestern professor in the movie had a helium balloon, which was to have been Dorothy's way back home. There was the journey to the ocean by the multitudes. The ocean is the unconscious, the beach is that boundary between the conscious and the unconscious. David is also my least grounded sibling. As a child and as an adult, dreaming or awake, he would often report having out-of-body experiences.

In one eight-hour period, all the universal themes of spiritual awakening presented themselves to me in a modern parable. Death and resurrection themes, the search for the Self and reconnecting to the Whole. Even the professor's request for me to paint something that I did not want to indicates the struggle I was going through at the time about what I felt I "should" do versus what I knew inside was right for me. I did not have to retrieve the witch's broom or a search for the Holy Grail when the treasure already lies within, waiting to unfold into action.

It was all too meaningful, I thought, to just be random chance, and I sought answers. Holography was clearly the starting point. Perhaps, in some cases, synchronicities like this might be somehow related to the non-local hidden variables later suggested by theoretical physicist David Bohm in his 1980 book, *Wholeness and the Implicate Order*. Bohm's theory supported the idea of a holistic, mutual interpenetrating and interacting universe. Michael Talbot, in his popular 1991 book *The Holographic Universe*, explored Bohm's ideas in depth and speculated that holomovement might explain synchronicity, ESP and other non-ordinary experiences. Up until this time, most physicists considered a holographic universe to be highly unlikely.

However, in 1994, "the Holographic Principle," was proposed by Dutch Nobel laureate Gerard 'tHooft, and further interpreted by Stanford physicist Leonard Susskind as a property of quantum gravity and string theories. In regard to the conservation of entropy inside a black hole, it was hypothesized that information entering a black hole is painted on the event horizon. They showed that mathematics supports the idea that information within the volume of a three-dimensional space can

be fully described by the two-dimensional surface enclosing that space. The idea of a holographic multiverse, while being taken seriously in 2025, has not yet been verified experimentally.

Even in the late 1970s, some scientists were already theorizing that the brain stores information holographically. Neurophysiologist Paul Pietsch memorably demonstrated this in over seven hundred experiments with salamanders. He did to salamander's brains what one of those fast-talking salesmen on cable TV with a slicer-dicer does to vegetables. He scrambled, flipped, separated, shuffled, diced, sliced, and, yes folks, even minced the brains of salamanders before dropping the mess back into their head cavity. No matter how he sliced it, so to speak, the salamanders still resumed normal feeding behavior.

In August 1998, and again in August 2006, in the light of many other such anomalous experiences that caused me to reevaluate this experience, I visited Arwin again in order to interview him on camera to document what had happened. In 1993 he had sent me a letter where he had checked his pilot's log regarding our flight. At the 1998 reunion, the retired professor told me he had sold the Pitts Special and I had not used my airbrush in a while, so instead of painting his engine cowling, I gave him a print of "Quercus Virginiana," which had been hanging in the window of the Bleeker Street gallery in 1977 when I visited the Museum of Holography in Manhattan.

Arwin's wife Peggy saw the synchronicities as God having some fun with us without having to show his hand, but her scientist husband did not believe in divine intervention. Rather, he saw the physical world as an interplay of interpenetrating "systems," with every event having a cause, even if the causes were perhaps not yet fully understood. I agreed with him, but we were still left with a mystery—a mystery that could possibly be solved if the universe is a hologram and everything is connected to everything else.

In the mid-1970s, I read Arthur Koestler's *The Roots of Coincidence*, which first introduced me to the term "synchronicity." The word was coined by psychoanalyst Carl Jung in 1920s, and further developed with physicist Wolfgang Pauli, the co-founder of quantum physics, to describe events grouped by meaning instead of cause. Jung also discussed the idea with Albert Einstein and Pauli in relation to relativity and quantum theory. Pauli's interest grew out of annoying coincidences associated with him that came to be jokingly known as the "Pauli effect." Experimental equipment

seemed to often break when Pauli was around, even if he had not touched it. The Pauli effect contradicted his demand for perfection and precise experiments that led to him coin the expression, “not even wrong” when referring to assertions that cannot be falsified by experiment. You cannot prove a negative, in other words, which is why it is silly for someone to say, after hearing the assertion there is no proof for the existence of God to say “You can’t prove there isn’t.” We cannot prove there is not a Santa Claus either, but to claim he exists is not *even* wrong.

A synchronicity is a meaningful coincidence with the assumption being made there was a not-yet-understood “acausal connecting principle” at work that draws from an deeper, underlying order, what Pauli called an *Unus mundus*. Jung believed that synchronicities often take place when a person is moving to a new stage in spiritual development, and synchronicity helps one to see a connection between the personal and the universal. I took an immediate interest in this notion because I had been prone to synchronicities from the time I was a child, with the first notable one occurring with finding the missing key on the hutch at the time I was also searching for a key that would lock out my doubts concerning God’s existence.

The second major synchronicity occurred when a million dollars was accidentally put into my bank account at the time I needed to find security for a bank loan in order to expand my business. In the second case, I was able to move from being a somewhat anxious and neurotic existentialist, into being calmer and more philosophical about the tendency for things to work out no matter what my state of mind was about it. This was essentially a spiritual awakening where I was more in touch with nature and comfortable in my own skin, without feeling I needed to petition an intercessionary being. I became a spiritual agnostic atheist. I felt connected to the universe, but didn’t believe in the existence of an Abrahamic type of deity.

A good example of a well-known synchronicity is the story regarding the tattered Prince Albert-style coat worn by Frank Morgan, the actor who played Professor Marvel’s character in the *Wizard of Oz*. During the 1938 production, a rack of old suits was purchased in a second-hand store on Main Street in L.A. The one that was chosen for the movie, which had the best fit and style, was discovered by Morgan to have been previously owned by *Wizard of Oz* author L. Frank Baum, who died almost two decades earlier. After Morgan found Baum’s name stitched inside of the coat pocket, the original tailor was found in Chicago and he verified the ownership

See notes on your logs - Q&A.

Speed Letter.

To Michael E. Arth
3043 Durand Dr.
Hollywood, CA 90068

From Arwin A. Dougal
Dept. of Elec. & Comp. Engr., ENES 112
The University of Texas at Austin
Austin, TX 78712

Subject "Response to Your 04/14/93 Letter & Enclosure".

MESSAGE

Date May 5 1993

Dear Michael:

Your letter w/ enclosed essays (pages 214-222) were delightful. You are a very discerning person = see attachment "AN ADVENTURER'S STORY by Decade." This was addressed to an Univ. audience, not an aviation audience. Anyway, that's how I prefer to think of myself, "...an adventurer!" On p. 217, your date is correct = my Pilot's Logbook shows a round-trip flight from San Marcos Municipal Airport to Mustang Beach Airport on Mustang Island March 26, 1978! Finally I could remember it all; we shared a lunch packed by my wife Peggy in the shade under the plane's wing at Mustang Island Airport. RE: p. 220, I wanted "PEG-OF-MY-HEART" painted on the Pitts' cowling! Oh well!

You are welcome to use my real name in the book - You wrote such introspective, thoughtful, respectful comments about me!

Signed

Date 19

As to adding to the story, I often relate to interested individuals about my first airplane flight in 1939 = "My first flight was in Pilot Robert Thorne's light blue, 40 HP Taylorcraft from my father's harvested oats field. This beautiful, small plane carried me aloft into the sky. And part of me stayed up there. Ever since I have to ascend again and again to find that part of me."

Last Saturday, May 1, 1993 I was at the San Marcos airport. By chance I encountered two 30+ year old brothers. They looked at my plane, and accepted my invitation to take a local sightseeing trip. During the flight I learned that one was a Delta airline pilot who had flown 727 that very morning! So I'm still flying and making new friends. Regards, Arwin A. Dougal

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with a notarized letter. The ownership of the jacket was also confirmed by Baum's widow who was presented with the coat after filming. One defining characteristic of a synchronicity is that it seem improbable. The jacket incident seemed so unlikely that it was widely believed to be a publicity stunt, thus necessitating the affidavits.

Even so, we cannot know for certain that it happened as told, which is why I have always been careful to document synchronicities in my life and why I interviewed both Professor Dougal and my brother on camera. I cannot personally verify the coat story, and because the demand for proof should be in direct proportion to the preposterousness of the story, I will stay agnostic about the Oz story, even though I tend to believe it. For my own stories, whether involving anomalous events or not, I do my best to be honest and document my own life properly. Memory is a slippery thing, even when events are recorded the same day, and good stories have a tendency to get embellished in the telling. Even so, I avoid letting a good story get in the way of the truth, especially when it comes to synchronicity.

Nevertheless, extraordinary claims require extraordinary evidence. While anecdotes do not count as reliable evidence, they can indicate further investigation is warranted. I also recognize a "reporting bias" or "file drawer problem" because I have a big file. By 2025, my autobiographical material had grown to over 13,000 pages. Even this, of course, is only a tiny fraction of my actual lived experiences. I have a special file for the best parts of my life's narrative—or at least the parts that might be interesting to others. All of this editing down makes me seem a lot more interesting than I really am on a daily basis. Nonetheless, Easter Sunday 1978 was an extraordinary day for synchronicities, by any measure.

In the compilation titled *Jung on Synchronicity and the Paranormal*, Carl Jung writes: "When coincidences pile up in this way, one cannot help being impressed by them—for the greater the number of terms in such a series, or the more unusual its character, the more improbable it becomes."

With LSD, I was much better able to see underlying connections between things and events, thus leading to a heightened awareness non-ordinary experiences. Admittedly, I was on the lookout for interconnections, so this played a role in causing more synchronicities to happen, but it still seemed there was something else at work. At the time, I was reading about how it was appearing to many physicists that nature behaved more like mind than matter. Once I was inclined to believe that

consciousness was an essential component of reality, events seemed to conspire to demonstrate this to me again and again.