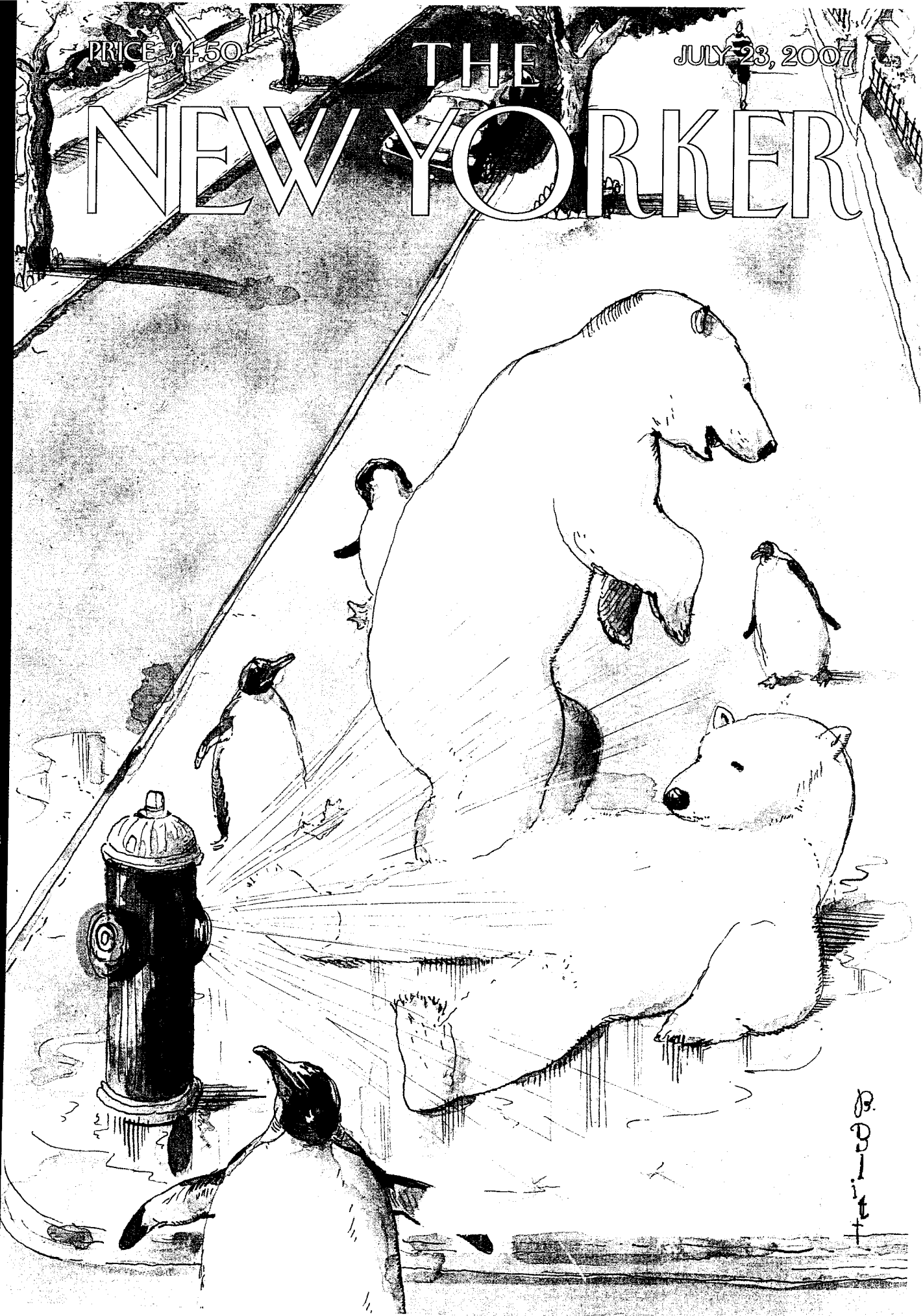


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# A BOLT FROM THE BLUE

*Where do sudden intense passions come from?*

BY OLIVER SACKS



*After the accident, he was inspired, even possessed, by music.*

Tony Cicoria was forty-two, very fit and robust, a former college football player who had become a well-regarded orthopedic surgeon in a small city in upstate New York. One afternoon in 1994, he was at a lakeside pavilion for a family gathering. It was pleasant and breezy, but he noticed a few storm clouds in the distance; it looked like rain.

He went to a pay phone outside the pavilion to make a quick call to his mother (this was before the age of cell phones). He still remembers every second of what happened next: "I was talking to my mother. There was a little bit of rain, thunder in the distance. My mother hung up. The phone was a foot away from where I was standing when I got struck. I remember a flash of light coming out of the phone. It hit me in the face. Next thing I remember, I was flying backwards."

Then—he seemed to hesitate before

telling me this—"I was flying forwards. Bewildered. I looked around. I saw my own body on the ground. I said to myself, 'Oh shit, I'm dead.' I saw people converging on the body. I saw a woman—she had been waiting to use the phone right behind me—position herself over my body, give it CPR. . . . I floated up the stairs—my consciousness came with me. I saw my kids, had the realization that they would be O.K. Then I was surrounded by a bluish-white light . . . an enormous feeling of well-being and peace. The highest and lowest points of my life raced by me. I had the perception of accelerating, being drawn up. . . . There was speed and direction. Then, as I was saying to myself, 'This is the most glorious feeling I have ever had'—*slam!* I was back."

Cicoria knew that he was back in his own body because he felt pain—pain from the burns on his face and on his left

foot, where the electrical charge had entered and exited—and, he realized, "only bodies have pain." He wanted to go back, he wanted to tell the woman to stop giving him CPR, to let him go. But it was too late—he was firmly back among the living. After a minute or two, when he could speak, he said, "It's O.K.—I'm a doctor!" The woman, who turned out to be an intensive-care-unit nurse, replied, "A few minutes ago, you weren't."

The police came and wanted to call an ambulance, but Cicoria refused. His family took him home ("It seemed to take hours," he recalled), where he called his own doctor, a cardiologist. The cardiologist thought that Cicoria must have had a brief cardiac arrest, but said, "With these things, you're alive or dead." He did not believe that Cicoria would suffer any aftereffects.

Cicoria also consulted a neurologist—he was feeling sluggish (most unusual for him) and having some difficulties with his memory. He found himself forgetting the names of people he knew well. He had a thorough neurological exam, an EEG, and an MRI. Again, nothing seemed amiss.

A couple of weeks later, when his energy returned, Cicoria went back to work. There were still some lingering memory problems—he occasionally forgot the names of rare diseases or surgical procedures—but his surgical skills were unimpaired. In another two weeks, his memory problems disappeared, and that, he thought, was the end of the matter.

What happened then fills Cicoria with amazement even now, a dozen years later. Life had returned to normal, seemingly, when "suddenly, over two or three days, there was this insatiable desire to listen to piano music." This was completely out of keeping with anything in his past. He had had a few piano lessons as a boy, he said, "but no real interest." He did not have a piano in his house. What music he did listen to tended to be rock and roll.

With this sudden onset of craving for piano music, he began to buy recordings and became especially enamored of a Vladimir Ashkenazy recording of Chopin favorites—the "Military" Polonaise, the "Winter Wind" Étude, the "Black Keys" Étude, the A-flat Major Polonaise. "I loved them all," Cicoria said. "I had the desire to play them. I ordered all the

sheet music. At this point, one of our babysitters asked if she could store her piano in our house—so now, just when I craved one, a piano arrived, a nice little upright. It suited me fine. I could hardly read the music, could barely play, but I started to teach myself.” It had been more than thirty years since the few piano lessons of his boyhood, and his fingers felt stiff and awkward.

And then, on the heels of this sudden desire for piano music, Cicoria started to hear music in his head. “The first time, it was in a dream,” he said. “I was in a tux, onstage; I was playing something I had written. I woke up, startled, and the music was still in my head. I jumped out of bed, started trying to write down as much of it as I could remember. But I hardly knew how to notate what I heard.” This was not surprising—he had never tried to write or notate music before. But whenever he sat down at the piano to work on the Chopin his own music “would come and take me over. It had a very powerful presence.”

I was not quite sure what to make of this peremptory music, which would intrude and overwhelm him. Was he having musical hallucinations? No, Cicoria said, they were not hallucinations—“inspiration” was a more apt word. The music was there, deep inside him—or somewhere—and all he had to do was let it come to him. “It’s like a frequency, a radio band. If I open myself up, it comes. I want to say, ‘It comes from Heaven,’ as Mozart said.” His music is ceaseless. “It never runs dry,” he said.

Now he had to wrestle not just with learning to play the Chopin but with giving form to the music in his head, trying it out on the piano, getting it down on manuscript paper. “It was a terrible struggle,” he said. “I would get up at four in the morning and play till I went to work, and when I got home from work I was at the piano all evening. My wife was not really pleased. I was possessed.”

In the third month after being struck by lightning, then, Cicoria—once an easygoing, genial family man, almost indifferent to music—was inspired, even possessed, by music, and scarcely had time for anything else. It began to dawn on him that perhaps he had been “saved” for a special purpose. “I came to think that the only reason I had been allowed to survive was the music,” he said. I

asked him whether he had been a religious man before the lightning. He had been raised Catholic, he said, but had never been particularly observant; he had some “unorthodox” ideas, too, such as a belief in reincarnation.

He himself, he grew to think, had had a sort of reincarnation—had been transformed and given a special gift, a mission, to “tune in” to the music that he called, half metaphorically, “the music from Heaven.” This came, often, in “an absolute torrent” of notes with no breaks, no rests between them, and he would have to give it shape and form. (As he said this, I thought of Caedmon, the seventh-century Anglo-Saxon poet, an uneducated herdsman who, it was said, had received the art of song in a dream one night and spent the rest of his life praising God and creation in hymns and poems.)

Cicoria continued to work on his piano technique and his compositions. He would travel to concerts by his favorite performers, but had nothing to do with musical friends or musical activities in his own town. This was a solitary pursuit, between himself and his muse.

I asked whether he had experienced other changes since the lightning strike—a new appreciation of art, perhaps, different taste in reading, new beliefs. Cicoria said he had become “very spiritual.” He had started to read every book that he could find about near-death experiences and about lightning strikes. And he had acquired “a whole library on Tesla,” as well as anything on the terrible and beautiful power of high-voltage electricity. He thought he could sometimes feel “auras” of light or energy around people’s bodies—he had never felt this before the lightning bolt.

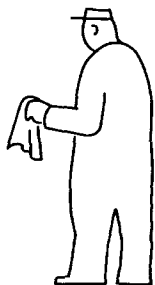
Some years passed, and Cicoria’s new life, his inspiration, never deserted him. He continued to work full time as a surgeon, but his heart and mind now centered on music. He got divorced in 2004, and that same year he had a fearful motorcycle accident. He had no memory of this, but his Harley was struck by another vehicle and he was found unconscious in a ditch, with broken bones, a ruptured spleen, a perforated lung, cardiac contusions, and, despite his helmet, head injuries. Nonetheless, he made a complete recovery and was back at work in two months. Neither the accident nor

his head injury nor his divorce seemed to have made any difference to his passion for playing and composing music.

I have never met another person with a story like Tony Cicoria's, but I have occasionally had patients with a similar sudden onset of musical or artistic interests—including a research chemist in her early forties, Salimah M. (I have changed her name and some identifying details.) In 2002, Salimah started to have brief episodes, lasting a minute or less, in which she would get "a strange feeling"—sometimes a sense that she was on a beach that she had once known while at the same time being perfectly conscious of her current surroundings and able to continue a conversation, or drive a car, or do whatever she had been doing. Occasionally, the episodes were accompanied by a "sour taste" in her mouth. She noticed these strange occurrences, but did not think of them as having any neurological significance. It was only when she had a grand-mal seizure, in the summer of 2003, that she went to a neurologist and was given brain scans, which revealed a large tumor in her right temporal lobe—the cause of her peculiar episodes. The tumor, her doctors felt, was malignant (though it was probably an oligodendroglioma, of relatively low malignancy) and needed to be removed. Salimah wondered if she had been given a death sentence and was fearful of the operation and its possible consequences; she and her husband had been told that it might cause some "personality changes." But, in the event, the surgery went well, most of the tumor was removed, and, after a period of convalescence, Salimah was able to return to her work as a chemist.

Before the surgery, Salimah had been a fairly reserved woman, who would occasionally be annoyed or preoccupied by small things like dust or untidiness; her husband said that she was sometimes "obsessive" about jobs that needed to be done around the house. But now, after the surgery, she seemed unperturbed by such domestic matters. She had become, in the idiosyncratic words of her husband (English was not their first language), "a happy cat." She was, he declared, "a joyologist."

Salimah's new cheerfulness was apparent at work. She had worked in the same laboratory for fifteen years and had always been admired for her intelligence and dedication. Yet, while losing none of this professional competence, she seemed a much warmer person, keenly sympathetic and interested in the lives and feelings of her co-workers. Where before, in a colleague's words, she had been "much more into herself," she now became the confidante and social center of the entire lab.



At home, too, she shed some of her Marie Curie-like, work-oriented personality. She permitted herself time off from her thinking, her equations, and became more interested in going to movies and parties, living it up a bit. And a new love, a new passion, entered her life. As a girl, she had been, in her own words, "vaguely musical," had played the piano a little, but music had never played any great part in her life. Now it was different. She longed to go to concerts, to listen to classical music on the radio or on CDs. She could be moved to rapture or tears by music which had carried "no special feeling" for her before. She became "addicted" to her car radio, which she would listen to while driving to work. A colleague who happened to pass Salimah in her convertible on the road said that the music on her radio was "incredibly loud"—he could hear it a quarter of a mile away. Salimah was "entertaining the whole freeway."

Like Tony Cicoria, Salimah showed a drastic transformation from being only vaguely interested in music to being passionately excited by it and in continual need of it. And with both of them there were other, more general changes, too—a surge of emotionality, as if emotions of every sort were being stimulated or released. In Salimah's words, "What happened after the surgery—I felt reborn. That changed my outlook on life and made me appreciate every minute of it."

Could someone develop a "pure" musicophilia, without any accompanying changes in personality or behavior? In 2006, just such a situation was described by the neurologists Jonathan Rohrer, Shelagh Smith, and Jason Warren in their striking case history of a Thai

woman in her mid-sixties who had severe temporal-lobe epilepsy. After seven years, her seizures were finally brought under control by the anticonvulsant drug lamotrigine (LTG). Prior to starting on this medication, as Rohrer and his colleagues wrote,

she had always been indifferent to music, never listening for pleasure or attending concerts. This was in contrast to her husband and daughter, who played the piano and the violin. . . . She was unmoved by the traditional Thai music she had heard at family and public events in Bangkok and by classical and popular genres of Western music after she moved to the United Kingdom. Indeed, she continued to avoid music where possible, and actively disliked certain musical timbres (for example, she would shut the door to avoid hearing her husband playing piano music, and found choral singing "irritating").

This changed abruptly when the patient was put on lamotrigine, they continued:

Within several weeks of starting LTG, [she] sought out musical programmes on the radio and television, listened to classical-music stations on the radio for many hours each day, and demanded to attend concerts. Her husband described how she had sat "transfixed" throughout "La Traviata" and became annoyed when other audience members talked during the performance. She now described listening to classical music as an extremely pleasant and emotion-charged experience. She did not sing or whistle, and no other changes were found in her behavior or personality. No evidence of thought disorder, hallucinations, or disturbed mood was seen.

While Rohrer and his colleagues could not pinpoint the precise basis of their patient's musicophilia, they hazarded the suggestion that, during her years of seizure activity, she might have developed an intensified neural connection between perceptual systems in the temporal lobes and certain parts of the limbic system involved in emotional response—a connection that became apparent only when her seizures were brought under control with medication. In the nineteen-seventies, the neuropsychiatrist David M. Bear suggested that such a sensory-limbic hyperconnection might be the basis for the emergence of the unexpected artistic, sexual, mystical, or religious feelings that sometimes occur in people with temporal-lobe epilepsy. Could something similar have occurred with Tony Cicoria?

Last spring, Cicoria took part in a

ten-day retreat for music students, gifted amateurs, and professionals. The music camp doubles as a showroom for Erica vanderLinde Feidner, a concert pianist who also specializes in finding the perfect piano for each of her clients. Cicoria bought one of her pianos there—a Bösendorfer grand, a unique prototype made in Vienna. She thought he had a remarkable instinct for picking out a piano with exactly the tone he wanted. It was, Cicoria felt, a good time—a good place—to make his *début* as a musician.

He prepared two pieces for his concert: his first love, Chopin's B-flat Minor Scherzo; and his own first composition, which he called "Rhapsody, Opus 1." His playing, and his story, electrified everyone at the retreat (many expressed the fantasy that they, too, might be struck by lightning). He played, Erica said, with "great passion, great brio," and, if not with genius, at least with creditable skill—an astounding feat for someone with virtually no musical background who, at forty-two, had taught himself to play.

What, in the end, did I think of his story? Dr. Cicoria asked me. Had I ever encountered anything similar? I asked him what *he* thought, and how he would interpret what had happened to him. He replied that as a medical man he was at a loss to explain these events, and he had to think of them in "spiritual" terms. I countered that, with no disrespect to the spiritual, I felt that even the most exalted states of mind—the most extraordinary transformations—must have some physical basis or at least some physiological correlate in neural activity.

At the time of his lightning strike, Cicoria had both a near-death experience and an out-of-body experience. Many supernatural or mystical explanations have arisen to explain out-of-body experiences, but they have also been a topic of neurological investigation for a century or more. Such experiences are relatively stereotyped in format: one seems to be no longer in one's own body but outside it and, most commonly, looking down on oneself from eight or nine feet above (neurologists refer to this as "autoscopy"). One seems to see clearly the room and people and objects nearby, but from an aerial perspective. People

who have had such experiences often describe vestibular sensations like "floating" or "flying." Out-of-body experiences can inspire fear or joy or a feeling of detachment, but they are usually described as intensely "real"—not at all like a dream or a hallucination. They have been reported in many sorts of near-death experiences, as well as in temporal-lobe seizures. There is some evidence that both the visuospatial and vestibular aspects of out-of-body experiences are related to disturbed function in the cerebral cortex, especially at the junctional region between the temporal and parietal lobes. (The neurologist Orrin Devinsky and others have described "autoscopy phenomena with seizures" in ten of their patients and reviewed similar cases in the medical literature, while Olaf Blanke and his colleagues in Switzerland have been able to monitor the brain activity of epileptic patients actually undergoing out-of-body experiences.)

But it was not just an out-of-body experience that Dr. Cicoria reported. He saw a bluish-white light, he saw his children, his life flashed past him, he

had a sense of ecstasy, and, above all, he had a sense of something transcendent and enormously significant. What could be the neural basis of this? Similar near-death experiences have often been described by people who have been, or believed themselves to be, in great danger, whether they were involved in sudden accidents, or struck by lightning, or, most commonly, revived after cardiac arrest. All of these are situations not only fraught with terror but likely to cause a sudden drop in blood pressure and cerebral blood flow. There is likely to be intense emotional arousal and a surge of noradrenaline and other neurotransmitters in such states, whether the effect is one of terror or rapture. We have, as yet, little idea of the actual neural correlates of such experiences, but the alterations of consciousness and emotion that occur are very profound and must involve the emotional parts of the brain—including the amygdala and brain-stem nuclei—as well as the cortex. (Kevin R. Nelson and his colleagues at the University of Kentucky have published several papers stressing the simi-

larities between the dissociation, euphoria, and mystical feelings of near-death experiences and those of dreaming, REM sleep, and the hallucinatory states in the borderlands of sleep.)

While out-of-body experiences have the character of a perceptual illusion (albeit a complex and singular one), near-death experiences have all the hallmarks of mystical experience, as William James defines it: passivity, ineffability, transience, and a noetic quality. In a near-death experience, one is totally consumed—swept up, almost literally, in a blaze (sometimes a tunnel or funnel) of light, and drawn toward a Beyond—beyond life, beyond space and time. There is a sense of a last look, a (greatly accelerated) farewell to things earthly, the places and people and events of one's life, and a sense of ecstasy or joy as one soars toward one's destination. Experiences like this are not easily dismissed by those who have been through them, and they may sometimes lead to a conversion or metanoia, a change of mind, that alters the direction and orientation of a life. One cannot suppose, any more than one can with out-of-body experiences, that such events are pure fancy; similar features are emphasized in every account. Near-death experiences must also have a neurological basis of their own, one which profoundly alters consciousness itself.

What about Tony Cicoria's remarkable access of musicality, his sudden musicophilia? Patients with degeneration of the front parts of the brain, so-called frontotemporal dementia, sometimes develop a startling emergence or release of musical talents and passions as they lose the powers of abstraction and language—but clearly this was not the case with Cicoria, who was articulate and highly competent in every way. In 1984, Daniel Jacome described a patient who had had a stroke that damaged the left hemisphere of his brain and who subsequently developed "hypermusia" and "musicophilia," along with aphasia and other problems. But there was nothing to suggest that Cicoria had experienced any significant brain damage after the lightning strike, other than a very transient disturbance to his memory systems for a week or two.

His situation did remind me a bit of that of Franco Magnani, the "memory artist" of whom I have written. Magnani had never thought of being a painter until he experienced a strange crisis or illness—perhaps a form of temporal-lobe epilepsy—when he was thirty-one. He had nightly dreams of Pontito, the little Tuscan village where he was born; after he woke, these images remained intensely vivid, with a full depth and reality ("like holograms"). Magnani was

consumed by a need to make these images real, to paint them, and so he taught himself to paint, devoting every free minute to producing hundreds of views of Pontito.

Could Tony Cicoria's musical dreams, his musical inspirations, have been epileptic in nature? Such a question cannot be answered with a simple EEG such as Cicoria had following his accident, but would require special EEG monitoring over the course of many days.

And why was there such a delay in the development of Cicoria's musicophilia? What was happening in the six or seven weeks that elapsed between his cardiac arrest and the rather sudden eruption of musicality? We know that there were temporary aftereffects—the confused state that lasted for a few hours and the disturbance of memory that went on for a couple of weeks. These could have been due to cerebral anoxia alone—for his brain must have been without adequate oxygen for a minute or more. One has to suspect, however, that Cicoria's apparent recovery was not as complete as it seemed, and that his brain was still reacting to the original insult and reorganizing itself during this time.

Cicoria feels that he is "a different person" now—musically, emotionally, psychologically, and spiritually. This was my impression, too, as I listened to his story and saw something of the new passions that had transformed him. Looking at him from a neurological vantage point, I suspected that his brain must be very different now from what it had been before he was hit by lightning or in the days immediately following, when neurological tests showed nothing grossly amiss. Could we now, a dozen years later, define the neurological basis of his musicophilia? Many new and far subtler tests of brain function have been developed since Cicoria had his injury, and he agreed that it would be interesting to investigate this further. But after a moment he reconsidered, and said that perhaps it was best to let things be. His was a lucky strike, and the music, however it had come, was a blessing, a grace—not to be questioned. ♦

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An audio conversation with Oliver Sacks.