

our scanning speeds which may vary from one individual to another or according to age and, perhaps, culture. They are strongest when the brain is unoccupied, searching for pattern which may be aural, traveling at the speed of sound or visual, traveling at the speed of light. Rhythmic sound, films, and TV impose external rhythms on the mind, altering the brain waves which have been otherwise as individual as our fingerprints, at least. It is entirely possible that the EEG records of a generation of TV watchers will be similar, even identical.

The Dream Machine was also featured in the films *Towers Open Fire* and *The Cut-Ups*, experimental collaborations between British filmmaker Antony Balch, and Burroughs, Gysin, and Sommerville. In *Towers Open Fire* Burroughs enters the hallucinatory world of the Dream Machines. He says: "Flicker administered under large dosage and repeated later could well lead to overflow of the brain areas . . . sound and even odors . . . that is a categorical characteristic of the consciousness expanding . . . Grey Walter produced many of the phenomena . . . Anything that can be done chemically can be done in other ways." *The Cut-Ups*, while filmed several years earlier, opened in London's Cinephone theatre on Oxford Street in 1966, and played for two weeks. As with the earlier literary cut-ups, the footage was spliced together randomly. There was no "direction." The dialog, taken in part from a Scientology text, was in its entirety: "Yes. Hello. Look at this picture. Does it seem to be persisting? Good. Thank you." The images include Gysin and Burroughs at a table with an umbrella; a young man in underwear; Burroughs outside the Burroughs Corp. building, and many images of spinning Dream Machines, some with Gysin. The effect of the image repetition is mesmerizing. In *Naked Lens*, a study of film and Beat culture, Jack Sargeant argues "the process of viewing *The Cut-Ups* is analogous to the process of viewing the Dreamachine; like the Dreamachine the film creates a rhythmic pattern of flickering light and images across the audience's retinas." The consequences were shocking.

The manager of the Cinephone said that in forty years in the business, he had never seen such a large accumulation of articles—handbags, overcoats, gloves, briefcases, hats—left behind in the cinema by disoriented audience members. Said Burroughs: "It looked like a battlefield."

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As the colloquial term for films, "flicks," suggests, motion pictures have a long history of evoking spontaneous flicker responses. In *The Living Brain*, Grey Walter described a particularly bizarre case of a man in the audience at a cinema who had a repeated impulse to strangle the person sitting next to him, although he never did, always coming to when his hands reached toward his neighbor's throat and his eyes looked away from the flickering light on the screen. Ian Sommerville had also written that "flicker may play a part in cinematic experience. The frame speed of film is three to four times faster than the average alpha rhythm but the film viewed may include flicker frequencies as a subharmonic." However, it was Tony Conrad, an American artist and minimalist composer interested in "the possibilities of harmonic expression using a sensory mode other than sound," who undertook a film project created with the expressed intention of evoking the flicker response among viewers. Once again, the germ of the idea was planted by Grey Walter. At Harvard in 1959, Conrad took an elective course in neurophysiology in which Walter's discoveries were discussed. But it was in a radically different context that Conrad came to the realization that film offered a natural venue for flicker experimentation.

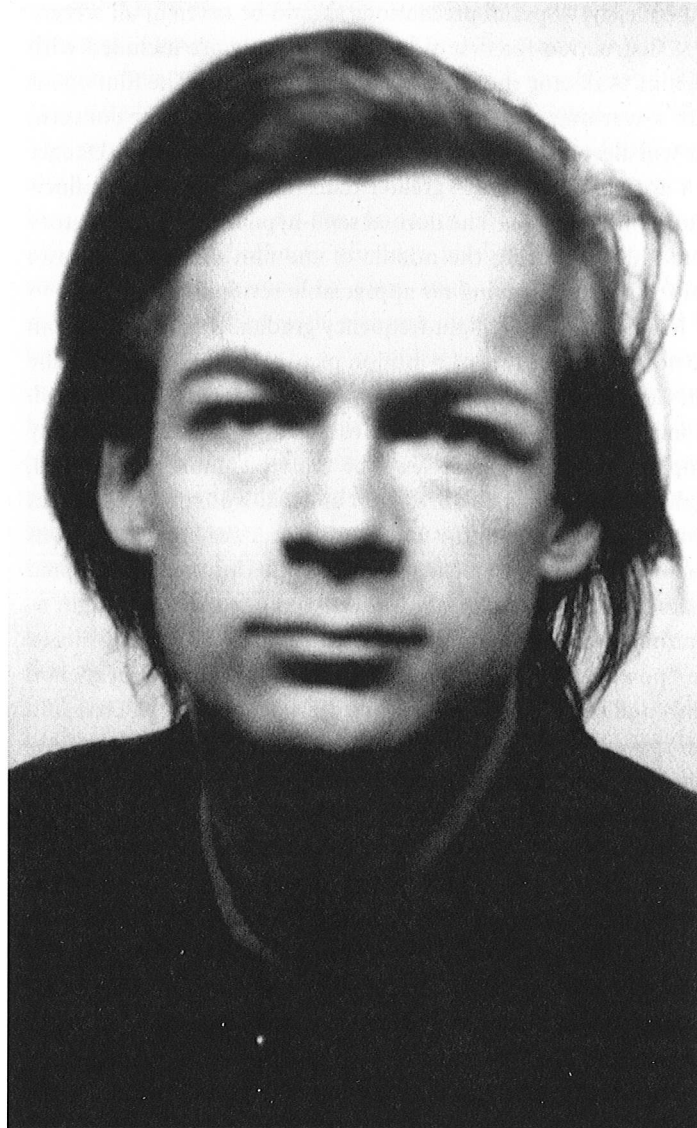
In 1964, Conrad, then age twenty-five, shared a New York tenement with Jack Smith, the filmmaker best known for *Flaming Creatures*, an influential underground movie for which Conrad provided the soundtrack. Smith had also invented the idea of underground "Superstars," a concept more often associated with Andy Warhol, and had surrounded himself with a

coterie of them, including a drag queen named "Mario Montez." One evening, Montez put on a spontaneous performance in their apartment, and overstimulated, Smith grabbed an antiquated 16mm silent film projector and pointed it at him. The projector had no lens, but did have a variable frame rate, and Conrad, remembering his studies, adjusted the frequency as low as it could go. As the projector flickered and flashed, Montez's sequins began to glimmer, his lipstick radiated, and soon everything seemed to glow with "an unearthly luminescence." Smith gasped with pleasure, and Conrad felt as if he had been transported into a "completely different psychic environment." He was astonished to find "the tools of cinema brought the experience of flicker within reach." Conrad had heard of Brion Gysin's Dream Machine, and although he never met Gysin, he was impressed with the idea that a process with such a daunting aura could arise from the simplest and most easily constructed materials and mechanisms. Conrad had the idea to make a film, *The Flicker*, based entirely on such effects, basically by "turning off" frames in an organized sequence, so that only some of the frames would be projected.

Concerned that the flicker effect "would really blow people's brains right out the back of their head," Conrad first consulted Sandor Rado, a prominent psychoanalyst, who had been a student of Freud and a former president of the American Psychiatric Association. Rado was intrigued by the idea. He told Conrad he had used flicker himself in the treatment of shell shock during the First World War, and attested to its effectiveness. On Rado's recommendation, Conrad contacted a doctor in New York who had clinical experience with flicker-induced seizures. It was Conrad's idea to include a warning at the beginning of the film, but the physician said he had at least as many people who showed up at his practice wishing to have epilepsy as those who were actually epileptic. He suggested it would be a better idea not to use a warning. Nevertheless, at its premiere at the New York Filmmakers Cinematheque in 1966, the festival catalogue did warn that *The Flicker* could induce photogenic migraine

and epilepsy: "Special precautions should be taken at all screenings. Instruction for first aid of seizure cases are included with the film. A doctor should attend or be available. The film opens with a warning notice which should not cause undue concern, but will alert the one in thousands who could be injured. Danger to a normal person is no greater than that of any other hallucinatory film or of TV. The normal semi-hypnotic or hallucinatory state induced during the middle of the film slowly withdraws toward the end, leaving no appreciable residual effect."

In *The Flicker*, the light frequency gradually shifts away from the normal flicker rate of a motion picture. Midway through the film viewers begin to experience unusual side effects. Said Conrad: "Some people saw insects and birds. Letters or numbers. Many people saw concentric circles—the most common was colored, jiggling mandala-type figures." So unusual were the experiences described by people in the audience that an academic study was made of them. A researcher at New York University attempted to describe the effects of *The Flicker*, and in particular sought to determine whether Smythies' report that subjects can experience the "power of addiction" was repeated among the experimental film's audience. The study reported an array of geometric and amorphous forms, and, unusually, the letters z and x , and several numbers. Definable objects included flies, beetles, eyes, the New York skyline, and "white lips against a purple background." A few people experienced entire action sequences. In one instance, a viewer saw someone swimming across the screen, and another saw a covered wagon train stretched across the landscape as in an old western shoot 'em up. Of the forty-four subjects, thirteen described intense involvement and gave evidence of having encountered "addictive phenomena."³³ Sandor Rado attended a screening, and was struck by what happened to the audience. Its members became "uncannily frozen," as if in a trance state. *The Flicker* itself became something of an underground classic. Conrad said it belonged in the genre of science fiction: "But rather than being transported to some sort of planet that in the end really just looks like Earth, with *The Flicker* you



Tony Conrad in a 1965 photobooth portrait. Conrad's film *The Flicker* was created with the expressed intention of evoking the flicker response among viewers. It premiered at the New York Filmmakers Cinematheque in 1966.

PHOTO COURTESY OF TONY CONRAD

become transported to a different planet which was entirely abstract—a parallel universe.” Flicker was also used in Paul Sharits’ *Ray Gun Virus*, Andy Warhol’s *Chelsea Girls*, and the reentry scenes in Stanley Kubrick’s *2001: A Space Odyssey*. In 1983, a film called *The Dream Machine* was produced by four filmmakers including Derek Jarman, featuring short film “dreams” inspired by the Dream Machine.

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Brion Gysin returned to Tangier to write *The Process*. He placed one of the novel’s narrators in Saskatchewan alongside “a young Psych prof . . . the first to use mescaline to show his class what he thought schizophrenia might be like.” Aldous Huxley makes an appearance, and is described as having consumed so much mescaline that even indoors, “the Northern Lights were playing about Mr. Huxley’s head.” *The Process* also contains flicker imagery, even at the slower frequency of the delta wave: “A bright shaft of sunlight fell through a chink in the door directly onto my closed lids. I fanned out my fingers, flickering them through the ray of light at something like the delta rate . . . My interior screen was swept by psychic static like a color 3-D TV screen in a blistering electrical storm . . . to know these wastes is to love them. Limitless bright pastures of light . . .”

Gysin wrote Peter Matson in June 1966 to tell him that John Giorno, who was visiting him in Tangier, had brought along copies of New York’s *Village Voice*, and upon reading them, Gysin could see that “everybody is picking up on strobe lights and flicker”—everyone, that is, except the illumination engineer Richard Kelly. Matson agreed: “There are a lot of lights flashing around New York but nothing like the Dream Machine so far.” He promised to try and get the Dream Machine blueprints back from Kelly, and said if necessary he would hire “a really stinky lawyer to blast him loose.”³⁴ Eventually, Leila Hadley took the turntable and cylinders to Abe Feder, a theatrical lighting genius. Hadley had discovered Feder through a socialite friend whose

apartment had been "lit" by him. Feder had done the lighting for more than three hundred Broadway plays, Buckminster Fuller's geodesic dome in Baton Rouge, the United Nations building and the high altar at St. Patrick's Cathedral, New York. Feder believed light conveyed more than 80 percent of all human sensory perceptions. "Light is a living material and a psychological experience," Feder declared. "Just as dogs can hear sound too high for human ears we are surrounded by images waiting to be transposed into visual experience—visions beyond eye-shot."³⁵ He tested the Dream Machine for a week, and declared that it could play "any music" on the human sight screen, but added that it had a considerable distance to go in its technical development. Feder had his own ideas on how to improve the Dream Machine and make it more marketable. He used a much stronger light than Gysin and Sommerville had used previously, replacing the 100 watt bulb with three 500 watt light tubes. Feder also introduced a second perforated cylinder which revolved in the opposite direction to the first. He next developed a means by which the light actually moved up and down inside the cylinder, and was experimenting with changing the color of the light itself to the primary colors of red, green and blue. Feder expanded the range of the Dream Machine so it was no longer necessary to sit immediately adjacent to the apparatus. He made it powerful enough so the effects could be felt across a living room. The plans were developed sufficiently for there to have been talk of exhibiting theatrically at Expo '67 in Montreal, in a completely black room with a Dream Machine in the middle as the only source of light "at \$5 a kick."

Richard Condon, author of *The Manchurian Candidate* and later *Prizzi's Honor*, wrote a magazine article on the Dream Machine, co-authored with Michael Mason, which predicted "it is coming, an extra set of eyes for the human race." The article was the first serious attempt, other than by its inventors, to explain the Dream Machine to a broader public, and it anticipates later scholarly attempts to define precisely its physiological effects. Condon wrote:

The essential ambition of the Dream Machine is to provoke something a little fancier than dreaming and a little less fancy than the recovery of pre-experiential memory . . . Huxley's "antipodes of the mind"; Jung's "collective unconscious." The Dream Machine rearranges components of experience into patterns which are new even to the unconscious mind and they do this by presenting to the perceptual system inputs of such extraordinary novelty that the mind/memory system hauls out its entire stock of perception memories and concept-memories and works itself dizzy trying to assemble and test different combinations of these components in an effort to recognize or explain the totally new perceptions . . . The Dream Machine presents an oscillation between consciousness and memory.

This identification of the "oscillation" presages later attempts to understand the interruption of consciousness invoked by flicker, and the resulting experience.

Another notable endorsement for the Dream Machine came around the same time. Because of his involvement in film and tape cut-up experiments, Ian Sommerville was recommended to Paul McCartney in 1966 as a candidate to operate a small recording studio in London dedicated to sound experiments. His association with Burroughs and Gysin gave Sommerville the necessary underground credentials. He had also continued to demonstrate the Dream Machine and proselytize the visionary capacity of flicker at every opportunity. When they met, Sommerville impressed McCartney with, among other things, his discourse on the use of stroboscopic light to produce hallucinations. He was immediately placed on the Beatles' payroll, and the equipment was set up in a vacant flat leased by Ringo Starr. Burroughs often visited, but other than Sommerville, who guarded access too rigorously, only McCartney ever used the studio. The arrangement lasted less than a year, but the Dream Machine had impressed one of the most famous and influential figures of the sixties. McCartney told his biographer, Barry Miles: "We used to sit around talking about all these amazing inventions that people were doing; areas that

people were getting into like the Dream Machine that Ian and Brion Gysin had made. It was all very new and very exciting." It was the ultimate endorsement. It all seemed so promising.

But then it all came to naught. Feder's experiments went nowhere. Condon's article was never published. Gysin pinned his last hopes on British businessman Jeremy Fry. Gysin described him as "the Fry chocolate heir, friend of Tony Snowdon etc. but he is more importantly, the inventor of ROTORK, the lock on all the pipelines in the world of whatever nationality—quite a cat."³⁶ Gysin was further encouraged by the appearance in *Esquire* magazine of an article by Timothy Leary that included Allen Ginsberg's declaration that the Dream Machine induced optical experiences similar to hallucinogenic drugs. Gysin had developed a reputation within sixties counter-culture. In March 1967, the English art dealer Robert Fraser, whom Gysin had previously taken on a tour of the Sahara, arrived in Tangier with the Rolling Stones in tow. They had come looking for Moroccan music, and turned up at Gysin's doorstep, according to Keith Richards, because "Brion Gysin knew various of the local tribes."³⁷ At one point Gysin ran to his neighbor Paul Bowles' door, panting that "the Rolling Stones are here, the Stones are here." Bowles, who had failed to keep abreast of the changing fashion in popular music, wondered if he was describing an unusual geological occurrence. Bowles poked his head in to be introduced, but upon seeing the Stones and their entourage sprawled in Gysin's one room apartment, made a hasty exit, Gysin observed, in a "state of shock." They were, Bowles wrote to Charles Henri Ford, "very much rolling [in money] and very stoned."³⁸ Bill Willis, a young American designer from Memphis who was waiting to begin work on the Palais de la Zahia in Marrakech for John Paul Getty, Jr., was among the party. Gysin's flat was perfectly suited for the occasion. It was, Willis thought, "a real hash-head's pad." Mick Jagger, Keith Richards, Brian Jones and their entourage were all passed out on mattresses on Gysin's floor. Willis, who was never a big smoker, preferring cocaine, was wide awake. Gysin told him: "You think you all discovered something new in

taking cocaine, well what do you think made people in the Twenties dance the Charleston so fast?"³⁹

The Stones were traveling in Keith Richards' blue Bentley with black tinted windows. They rented a second car, and Fraser, Willis, and Gysin joined the Stones' rock and roll circus as it moved on to Marrakech, where an entire floor of the El Saadi Hotel was rented. There were dinners at 3 A.M., drives into the desert, breakfast in French colonial inns, and, Gysin said, Brian Jones making out with a tattooed Berber with breasts like blue basket work. Sexual politics was causing friction inside the band. Jones' girlfriend, Anita Pallenberg, and Keith Richards had something going. Gysin picked up on it: "Brian and I drop acid. Anita sulks and drops sleepers. Goes off to sleep in the suite she shares with Brian. Keith has plugged in and is sending some great throbbing sounds winging after her and out into the moonlight of the desert." Anita Pallenberg said Richards arranged for a little diversion, to have Gysin take Jones to Jajouka to hear tribal musicians while she left with his bandmate. Brian Jones stayed on with Gysin for a short while in Tangier, listening to tapes of the Master Musicians of Jajouka.⁴⁰ In London, Jones mastered the tapes of Moroccan "interplanetary" sounds, with the result that an album was released on Rolling Stone Records titled *Brian Jones Presents the Pipes of Pan at Joujouka*.

Gysin had been truly at the right place and what should have been the right time, ahead of the onset of the psychedelic sixties, and then at its epicenter, with a fascinating contraption more stimulating than any Lava Lamp, and bearing the counterculture and pop culture seal of approval, and yet it still failed to find the mass market he had sought. Condon imagined it possible to manufacture the Dream Machine in "models in any style of home decoration, place it in the middle of the coffee table as a permanent art object and permit the entire family to 'tune in and turn on' simultaneously." But it was not to be. As Gysin put it: "The Dreamachine should have been the great drugless turn-on of the sixties . . . and it didn't work. It was, and still is, too

new.” Instead, he had to content himself with statements, like that of *Rolling Stone* writer Stephen Davis, that “Gysin’s Dreamachine helped inspire the psychedelic light-show movement, when every local rock palace had its own, throbbing, strobe-driven display flashing behind the band.”

Indeed, by 1968, ten years after Gysin’s initial exposure to the flicker effect during his famous bus ride to Marseilles, and four years after he traveled to New York to market the device, stroboscopic lights were flashing everywhere. They were not a mass-produced home component, but had been taken up by the drug culture. Ken Kesey featured strobe lights at his “Acid Tests”—parties where he served guests LSD-laced Kool-Aid to the music of the Grateful Dead. At one Acid Test the “stroboscopic trampolinist”—an Olympic trampolinist who wore a mask to preserve his amateur status—performed under a strobe light as the Dead played. Tom Wolfe wrote in *The Electric Kool-Aid Acid Test*: “The strobe has certain magical properties in the world of the acid heads. At certain speeds stroboscopic lights are so synched in with the pattern of brain waves that they can throw epileptics into a seizure. Heads discovered that strobes could project them into many of the sensations of an LSD experience without taking LSD.” Wolfe wrote the fragmenting into images was like “an old flicker movie” but that the result had “all of history pinned up on a butterfly board.”

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The proliferation of flicker did not go unnoticed by Grey Walter, who told an audience in September 1968, only partly in jest: “Illusory experiences produced by flashing lights may be in fact quite interesting. Nowadays they are used as a standard method of stimulation in some subcultures. I should be paid a royalty because I was the first to describe these effects.” He noted the “intense and widespread resurgence of interest in mystical experience” not only through flicker, but a variety of mechanisms, including psychedelic drugs: “My hope is that they are

the first gropings toward a full realization of the variety of human nature.” Walter’s own later investigations, focused largely on his discovery of the Contingent Negative Variation, or expectancy wave, a sensory motor sign of expectancy, resulted from his ongoing experiments with stroboscopic light and the brain. Walter detected the Contingent Negative Variation when observing EEG responses of subjects exposed to a click followed by flicker, which could be terminated simply by pushing a button. After the click, the expectancy wave appeared a moment before the act of terminating the flash. The discovery, published in *Nature* in 1964, created enormous scholarly interest, and became the subject of thousands of publications and the topic of several international conferences. The stroboscope similarly played a role in Walter’s study of the human mind’s capacity to appreciate and react to completely novel and apparently trivial developments, experiments that he argued would have a bearing on mankind’s suitability to undertake space travel. Subjects were exposed to flashes of light in twos or threes, as well as tones at low and high pitch. Each stimuli was followed by a loud penalty noise “nasty enough to evoke a violent start.” The penalty, however, could be avoided by manual movement of a small lever. The subjects were left to figure out how and when to move the lever, having been told only that it might help them. The solution appeared easy to the designers of the experiment: low-tone, double flash meant that the lever should be moved to the left; high tone, triple flash to the right. Wrote Walter: “the association is perfectly obvious, but to our surprise very few subjects respond correctly to the association before about the fortieth trial.” He argued that if astronauts “are expected to operate some control system, or explore remote worlds, they must expect to be surprised and still appreciate things as they are and not as they might have been if the universe had been ordained expressly for our entertainment.” The research questioned the advantage of human crews over computers in space exploration.

Flicker was also used by Walter in an experiment designed

to interpret the nature of creativity. He found that when a person guesses that a particular event will occur, such as a flash of light, the brain emits an electrical signal as if the event had occurred, whether it had or not. The brain is actually imagining, and hence creating an event. Said Walter: "The electrochemical changes in the brain are as 'real' as when the stimulus is real. The brain has created an image of what might have been." By contrast, however, when the brain guesses that an event will not occur, there may be no response registered by the EEG. He said that people find inspiration by inducing very unusual physiological states. Exposure to stroboscopic light, or to drugs, or fasting, allow for hallucinations which may provide a sense of insight and inspiration: "The poet in his garret who is underfed, underexercised, underprivileged (as we say now), may get himself into a state in which hallucinations and fantasy can supervene in such a way that all he has to do is collect the lines."

In perhaps its most unusual application, Walter speculated in 1968 that flicker might be used to detect Psi, or paranormal functioning. His interest in applying physiological methods to the study of paranormal experience was inspired by Eileen J. Garrett, a psychic who had achieved notoriety years earlier for having "channeled" top secret details of the crash of the British dirigible R-101, and for her subsequent threatened arrest under provisions of the Official Secrets Act by authorities who did not believe in her powers. In 1951, Garrett established the Parapsychology Foundation in New York to advance research into paranormal phenomena. Aldous Huxley, John Smythies, Humphry Osmond, and Brion Gysin had all also known Garrett. Gysin met her in the 1940s, when she published some of his writing. He believed unequivocally in what he termed "the magical universe" and attributed illusory experience to it. Garrett had an enormous influence on him. As Timothy Leary wrote of Gysin: "He performed the rites and lefts in Eileen Garrett's temples and absorbed the message of that fantastic medium." He once claimed to have seen Garrett reach up and appear to bring the moon down to her penthouse apartment on

Madison Avenue. On another occasion, at a party at her home, he had seen someone perform the stigmata. Two red spots appeared, then a gelatinous substance oozed out of the man's right hand. Garrett gave a shriek: "Ectoplasm as I live and breathe!" Afterwards, with the man recovering in the washroom, she put down her champagne glass and began crawling around the floor on her hands and knees looking under the furniture. Gysin asked what she was doing, and she replied, "Well, my dear, there are tricks in every trade."⁴¹

Huxley had attended several of Garrett's conferences, delivering a paper on "The Far Continents of the Mind" at one of the foundation's first major meetings, the International Philosophic Symposium in 1954. Huxley introduced Smythies and Osmond to Garrett, and they attended her Le Piol conferences, held at the European headquarters of the foundation in St. Paul de Vence in the south of France, where participants sought scientific explanations for parapsychological phenomena. Walter similarly attended Garrett's parapsychology conference in France in 1961, his view being that, "all mental—or if you like psychic—phenomena can be rigorously described in terms of physiological mechanism." In 1963, he was chairman and principal speaker at a conference organized by Garrett on "Psychophysiological Correlates of Paranormal Mental States."

At one of Garrett's conferences, Humphry Osmond noted a similarity between mediumistic experiences described in the literature of parapsychology, and the experiences he had observed with subjects under the influence of LSD and mescaline while working at Weyburn Hospital, including what he described as "a major, witnessed, thought transference." He wondered about a possible relationship between psychic and psychedelic experience. In 1968, Walter picked up on the point, delivering a paper on the Contingent Negative Variation and its significance for Psi research. He discussed "a sort of electronic ESP, which might be incorporated into parapsychology experiments." Walter said that by an EEG record, it is possible through observation of expectancy waves to determine when a person is

going to do something. At a later lecture given at Cambridge, he described the phenomenon: "It is an eerie experience to discern through an electrical machine the genesis of a person's intentions, to predict his decisions before he knows his own mind. Even more impressive is the experience, when one is oneself harnessed to such a machine, to find that by an effort of will one can influence external events, without movement or overt action, through the impalpable electric surges in one's own brain." A computer can be programmed to recognize the shape and size of the changes in brain patterns and accordingly complete the intended action: "After perhaps half an hour of practice, the subjects lie there and think to themselves: 'I want the television picture to go on.' And it appears."

Walter argued that flicker was one stimulus generator that would prove "very important for the study of parapsychological phenomena," and a notable subject of his ongoing experiments was Eileen Garrett, who was exposed to the stroboscope, first in a normal state, and then after having been administered 100 micrograms of LSD. While under the effects of LSD, Garrett "described her particular vision of the universe" and told Walter she saw him as "Zeus, controlling things." The main neurological change observed in Garrett was an enormous increase in the distribution of expectancy waves in response to the flashes. Walter concluded that "the effects of LSD are not on a primary visual pathway, but diffuse on the projections of visual information to the non-specific areas of the cortex in an almost explosive form." He also suggested that EEG responses might be able to act as indicators of parasensory detection of remote stimuli, namely stroboscopic light, although he never tested the theory himself. In 1970, Grey Walter was seriously injured in an accident while riding his motorscooter, which left him in a coma for three weeks and necessitated brain surgery. At one point his pulse and breathing stopped. Walter later wrote about the "miracle" of his survival, and noted the irony of the nature of his injuries, but he never fully recovered. A colleague who had known him for many years described how, at their first meeting after the accident, she had looked into his eyes and "found nothing there." He died in 1977.

PHOTO COURTESY OF THE PARAPSYCHOLOGY FOUNDATION



Eileen Garrett (center), shown with W. Grey Walter (second from right), at Le Piol, in St. Paul de Vence, in the South of France, site of the Parapsychology Foundation's legendary conferences during the 1960s.

Walter's proposal to test ESP functioning was subsequently taken up by physicists Russell Targ and Dr. Harold E. Puthoff as part of a series of experiments conducted at the Electronics and Bioengineering Laboratory, Stanford Research Institute, in Menlo Park, California, from 1974–76. They experimented with having one subject (the sender) exposed to stroboscopic light at intervals of sixteen flashes per second, while another subject (the receiver) was monitored by an EEG in a separate room, acoustically and electronically shielded, with no flash present. One of the most interesting results was achieved when the "receiver" was asked to indicate by push of a button whether the light was flashing in the other room. Her correct responses were considered equal only to chance. By contrast, the accuracy of her EEG response was considered statistically significant: "The experiment provided direct physiological (EEG) evidence of perception of a remote strobe light even in the absence of overt conscious response." Targ and Puthoff concluded that the results provide evidence for the existence of a "channel" allowing for "non-cognitive awareness of remote happenings," a finding they argued had an implication for paranormal research. In a paper published in *Nature*, they further suggested remote perceptual ability might exist widely in the general population, but because the perception is below most individual's level of awareness, it goes unnoticed. They proposed the use of stroboscopic light and EEG in order to screen for the ability in the general population.

Scientific interest in flicker continued to grow exponentially with scores of additional studies appearing in the academic literature. That flashing light can evoke EEG rhythms, the so-called photic driving response, has been widely investigated, and studies found abnormal responses in patients with Alzheimer's disease, schizophrenia, and depression, introducing the possibility of clinical application. One study found that rhythmic flashing light could alleviate anxiety states. Another found that the stimulation increased the suggestibility of subjects, and yet another demonstrated that people with imagination experienced more vivid imagery. Researchers also looked at the EEG

responses to the flashes among practitioners of transcendental meditation. In that 1975 study it was reported that despite the non-use of mantra, (i.e. participants were not actively meditating), the subjects nevertheless felt as if they had been meditating after exposure to flicker. It was also found that the subjects who meditated regularly entered into an "altered state of consciousness" more quickly than those in a control group.

One investigation, at Tel Aviv University, confirmed some of the effects described nearly a half century earlier by Walter, and concluded flicker is a "convenient method" to induce an altered state of consciousness, identifying features such as disturbed sense of time, somatic and visual hallucination and perceived changes in body shape. In that study, one subject described the flicker as having a "physical" influence on him, and said he felt as if his head had become detached from his body and begun to drift. A second subject described auditory effects that reminded him of a Pink Floyd track.⁴² Another study quantified the imagery perceived by type, concluding different patterns of swirling lights were evoked in 80.3 percent of subjects, specific geometric patterns in 60.5 percent, and dream-like states with a series of well-defined complex scenes in 32.9 percent. Australian research concluded that of the many mechanisms, including hallucinogens, which "facilitate into awareness of visual imagination images, the easiest, safest and most precise in its effects, is photic stimulation." Significantly, that study suggested carefully selected flash frequencies "may provide greater control over the state of consciousness to be induced." It also noted that while the illusory images encountered were primarily novel, one female subject relived a scene from the previous evening, except that it was an alternate version of experience, similar but not identical. She said, for example, "I have different clothes on . . . well, actually, clothes I've never seen before . . ."⁴³

Finally, another researcher, Dr. Michael Persinger, found a direct correlation between visions and measurable brain events. In one experiment, a physician in his 30s was subjected to a stroboscope, and was startled by a religious vision: "We were using a strobe and this individual saw Christ actually in the

strobe at the same time we measured good old-fashioned temporal lobe spikes showing unusual activity in the brain area just above the ear: i.e., the record of a scientifically explicable phenomenon." Persinger, of Laurentian University, in Sudbury, Canada, subsequently altered the experiments to include a sound-proofed chamber where subjects would sit wearing a Koren Helmet, a device resembling a motorcycle helmet but embedded with small electromagnetics or solenoids to target the temporal lobes with very low doses of complex, low intensity magnetic fields (less intense than a hair dryer generates). The basic idea was the weak, but complex magnetic fields shaped by computer programs to imitate natural brain activity should be as effective as flashing lights. In his experiments, Persinger typically found that normal subjects report a "presence" in the chamber. For some it is a religious or mystical presence, and for the more contemporary-minded, an alien visitation.⁴⁴

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In 1976, Ian Sommerville was fatally injured in a motor vehicle accident near Bath, England, at age thirty-six. William S. Burroughs, who was living in New York, had difficulty accepting the death of his friend of seventeen years. The full realization of what had happened did not hit him until several hours later when an image of Sommerville peering at a Dream Machine flashed through his mind. Burroughs wrote Gysin: "Can't say I had any sort of premonition." Gysin, living again in Paris, read aloud to himself sections of the *Tibetan Book of the Dead*. He hoped that when he fell asleep, it would help him dream of Sommerville. Unlike Burroughs, who often had remarkably complex dreams that he studiously recorded, Gysin complained that when he slept, he had "the most depressing, boring dreams, like being on the Metro sitting next to ugly people, being involved in most boring conversations."⁴⁵ This time he had a vivid dream. But instead of nostalgic memories of Sommerville, Gysin wrote Burroughs to tell him he had been attacked in his dreams by a Tibetan lama holding up a text wrapped in a white scarf, and

then set upon by three vicious Tibetan women. Burroughs replied curtly: "Am writing my own Book of the Dead. Tibetan full of errors. Womb door closed or not before death not after."⁴⁶

In 1976, the Centre Pompidou, Paris, acquired a Dream Machine prototype for its permanent collection. Three years later, an art dealer, Carl Laszlo, finally underwrote the production of a limited edition of twenty Dream Machines. In June 1979, an exhibition, Dreammachines, opened at Galerie von Bartha, in Basel, Switzerland. Gysin was joined by William Burroughs and Albert Hofmann at the opening. Also present was R. Gordon Wasson, a vice-president of J. P. Morgan and Company, who in 1957 wrote an early, laudatory account of magic mushrooms, and his experiments with them, in *Life* magazine. With Hofmann, Wasson later wrote a book arguing that the rite of the Eleusinian mysteries was an ancient equivalent of the Acid Tests. A few days after the exhibition opening, Gysin, Burroughs, Laszlo, and a young German writer and translator, Udo Breger, were invited to Hofmann's house. After tea, they went for a walk in his beautiful meadow, which stretched across an invisible border into France. Afterwards, they had some wine. There was, said Breger, "much talk and philosophizing about altered states of mind." Laszlo's edition marked the culmination of Gysin's efforts to market the Dream Machine. In the end the device was not to replace television as the ultimate home leisure component, unleashing visions and changing consciousness through homemade optic movies, but was produced as an *objet d'art* and sold to a handful of wealthy collectors. Gysin blamed equally a television industry concerned for its home visual sensory monopoly, and base fear: "I think it scares people . . . because of the fact that it deals with that area of interior vision which has never been tapped before." The corporate world probably had less sinister motives: they could not begin to imagine how to market it, and there were also the old concerns that the flicker effect would induce not hallucinations, but epileptic seizures, raising the potential for legal liability.

Ian Sommerville had always emphasized, however, that "the basic machine is that which anyone can put together from the

instructions,” and it was largely through the efforts of Genesis P-Orridge, a British musician and artist, and founder of the prototypical industrial music band Throbbing Gristle, that the Dream Machine found its audience. While an alternative legend for his musical experiments, P-Orridge—originally plain Neil Megson of Manchester—had first made a reputation on the margins of the British art world with COUM Transmissions, a performance art troupe. An installation at London’s Institute of Contemporary Art featuring nude photographs of P-Orridge’s then-girlfriend, and small sculptures using tampons, resulted in P-Orridge being dubbed “tampon man” in the *Daily Mirror*. Nicholas Fairbairn, a Conservative MP, was quoted in the *Daily Mail* decrying the exhibition as “a sickening outrage,” and the artists as “wreckers of civilization.” When P-Orridge was charged with obscenity after mailing “pornographic” post card art in November 1975, William S. Burroughs provided a character reference, writing Highbury Corner Magistrates’ Court: “I consider him a devoted and serious artist in the Dada tradition.”⁴⁷ The intercession of the author of *Naked Lunch* did not aid the defense, and P-Orridge was found guilty and fined. In P-Orridge, Gysin found his Dream Machine heir. He gave P-Orridge his blessing to publish the Dream Machine plans, but P-Orridge did much more, exposing a new generation to stroboscopic light as a method to alter consciousness. He issued a video and with Psychic Youth, a later band, released a CD of flicker researches, *Brion Gysin’s Dreamachine*. The recording featured multi-layered human voices whispering into the machine, which chopped the sounds up, enhancing the effect. P-Orridge himself undertook dozens of hours of viewings, and concluded it, “seemed to create telepathic links and even a witnessed transformation of body shape . . .” He likened the devices to the U.S. space program, describing them as “sleek silver Space machines . . . to take us further, faster and deeper into infinity.” He became convinced that the device acted as an invocation: “It can call out that same blue light mentioned in high Egyptian magic and in Sufi texts.” It evoked for P-Orridge a spectral blue cloud of what he described as “intelligent energy.” The result could, P-Orridge

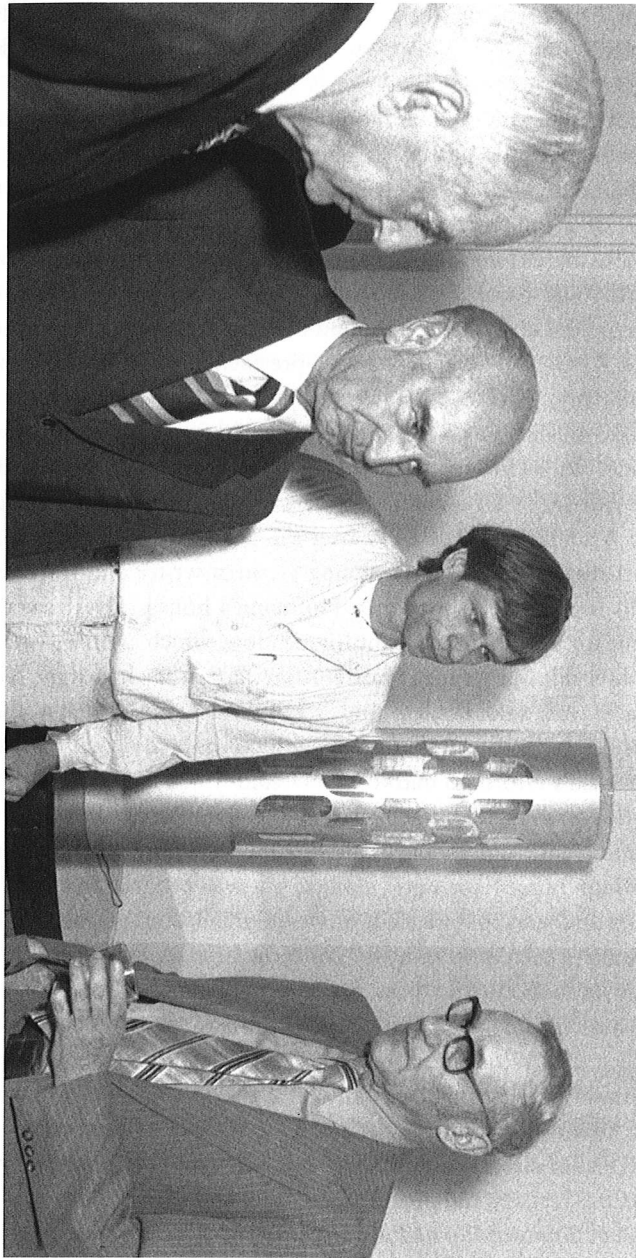


PHOTO COURTESY OF FRANÇOIS LAGARDE

Explorer R. Gordon Wasson, LSD discoverer Albert Hofmann, writer and translator Udo Bregger, and William S. Burroughs, at Brion Gysin’s Dreamachines exhibition, in Basel, Switzerland, June 1979.



Genesis P-Orridge, in Brighton 1989, with Large Dreamachine used for group viewings, built by John Gosling of Zoskia. This machine was confiscated by Scotland Yard in 1992 during a raid in which P-Orridge's archives and art were seized.

PHOTO COURTESY OF PAUL CECIL

felt, break the encrypted code to what he termed "Holy knowledge . . . all archetypes, symbols, neurological equations and powers." For that reason he agreed with Gysin that its "suppression" was no accident. It was, after all, "a machine that for the price of a light bulb leads you drugless into the core of your being . . . and bridges the abyss between sleep and wakefulness, conscious and unconscious life." The book accompanying the CD included a text by Andrew McKenzie, of the Hafler Trio, deploring the lack of recognition given an invention "that allows the potential for individual self-knowledge [and] facilitates access to finer and rarer rates of vibration and planes of existence by means of an almost ludicrously simple construction." McKenzie added that the Dream Machine made it possible for time to become "a property of being in much the same way as the concepts of weight, taste, or emotion."

In the last months of his life, Brion Gysin loaned a Dream Machine to the artist Keith Haring, who considered Gysin a genius and a great teacher. Haring asked him, "Can I show it in night clubs? Can I show it anywhere around?" Gysin thought it the most promising thing that had happened to the Dream Machine in twenty years of "sorrows and blind alleys."⁴⁸ At the end, Gysin feared that he had lived "a life of adventure, leading nowhere." After a visit at his rooms overlooking the Beaubourg, the American composer Ned Rorem made note of the gloom and "wish for extinction" that characterized Gysin's last years. Writing in his diary, Rorem reminisced fondly of Gysin, but not before he asked a question Gysin himself might have posed: "What is the worth of his famous simpleminded stroboscopic lamps, his linoleum paintings, his mudpie collaborations with Burroughs . . . ?"⁴⁹ Gysin died in Paris in July 1986. Yet more than simply surviving him, his ideas flourished, sometimes gaining notoriety in unexpected ways. Among the speculation that followed the 1994 suicide of Nirvana's Kurt Cobain was a theory publicized in *Q* and *High Times* magazines and the *New Musical Express* that the death was somehow linked to Gysin's "allegedly trance-inducing strobish device." There were reports that Cobain used the Dream Machine for up to seventy-two hours in a single

session and that it drove him to suicide. A group calling itself "Friends Understanding Kurt" faxed a press release to various news organizations, claiming a "string of suicides associated with the machine since the 1960s." The press release stated after he obtained one of the devices, "Kurt immediately commenced a habitual, perhaps maniacal use of the Dream-machine, then took it with him to his and Courtney [Love]'s shared Seattle mansion where he stationed himself with the device in a room above the garage." It stated the Dream Machine was found in the room where Cobain died, although police and medical examiner reports contradict that. Nevertheless, the claims were widely published. William S. Burroughs, who knew Cobain and had collaborated with him, dismissed such speculation as "nonsense." *High Times* supported that view, albeit disparagingly, reporting that the "flashes of light may, if the subjects are susceptible, create a mild sensation akin to the simplest light show. Aided by the inhalation of good pot and the sound of hot rock, the device might create at best a mild dreamlike sensation, or at worst (unless you're prone to epileptic seizures) an even milder headache." The Cobain story was ultimately proven to be a hoax, but not before a book of homages, called *Flickers of the Dreamachine*, suggested conspiratorially the Dream Machine was "involved, if somewhat obliquely"—but then failed to elaborate.

Flickers of the Dreamachine, which included reprints of the *Olympia* texts by Gysin and Sommerville, excerpts from *The Living Brain*, the testimonials of friends, and contributions by others influenced by the device, including Genesis P-Orridge, was published in 1996. The book included how-to instructions adapted to a 45 rpm turntable. In one essay, Ian MacFadyen made the case for the broadest interpretation of its powers: "The Dreamachine itself may be seen as a kind of Buddhist Wheel of Life, a model of the Kalachakra time-machine, its revolutions spinning through the delusions and endless repetitions of ego, projecting all the images and illusions of life." The book's editor, Paul Cecil, wrote of Gysin: "In the Dreamachine he left a device that bypasses language. With it we can become creators of worlds and destroyers of illusion. No-one can deny us the

opportunity to begin the process. There is literally everything yet to be discovered." Also in 1996, the Los Angeles County Museum of Art featured the Dream Machine, as refabricated by David Woodard, in a major exhibition, "Ports of Entry: William S. Burroughs and the Arts." In the accompanying catalogue, curator Robert A. Sobieszek observed that the device, as a means of visualizing interior images, was "potent and possibly even dangerous." Sobieszek disregarded the claims of its inventors that it represented "an end of art" and placed it firmly in the context of art: "In a way, the Dreamachine was part of art culture of the 1960s, a strange, mechanical hybrid incorporating features of Marcel Duchamp's vertiginous Rotary Demisphere (Precision Optics) (1925), the articulate energies of a machine sculpture by Takis, and the psycho-optical light effects of a work by Francois Morellet. Part scientific experiment and part artwork, the Dreamachine was a demonstration of Burroughs's belief that 'there's going to be more and more merging of art and sciences.'" Sobieszek concluded that flicker vision was "an apt metaphor for the kind of nonsynchronized, nonlinear, and utterly dematerialized world of events faced in the late twentieth century."

In 2000, Gysin and Sommerville's invention was included in an exhibition of art concerned with dreams and altered states of consciousness entitled "Dream Machines," organized by the Hayward Gallery, London, and selected by Susan Hiller, an American artist living in Britain. Hiller, and her husband, the novelist David Coxhead, had been introduced to the Dream Machine by Sommerville in the late 1960s. In the exhibition catalogue, Hiller—whose own 1987 machine Magic Lantern produces after-images of brilliant hues that are "not really there" and is intended to induce a hallucinatory state of reverie—hailed the Dream Machine as a "germinal work" among Western art concerned with the psychology of consciousness, mental states, and the unconscious. It was, Hiller argued, designed to "kick-start the visionary capacities of spectators," allowing them access to the "unstable zones where the visual merges with the visionary." An accompanying essay, by cultural theorist Jean Fisher, argued the flicker of sunlight through the avenue of trees as Gysin's

inspiration for the Dream Machine, is analogous to the motivation behind the dream-like opening sequences of Federico Fellini's *8½*, representing a director's search for inspiration, and to French artist Henri Michaux's reflections on drawing under the "flash-back" effect of mescaline.

In his posthumous novel, *The Last Museum*, Gysin included his final references to flicker. Early in the novel, the aged narrator relives Gysin's own first encounter with stroboscopic patterns: "As we swept down the avenue of bare trees, I shut my eyes against the glare of the low winter sun hanging like a billion-watt bulb setting between the evenly spaced trunks. They were planted at exactly the right distance apart and we are traveling at exactly the right speed for them to produce flicker in the alpha band, at between eight and thirteen interruptions of light per second. Well-remembered galaxies begin to spin through my interior space, flashing in all their unearthly colors. I am delighted, naturally. It means that my EEG has not flattened out yet and the old brain is still working." Later, near the end of the book, the bright flashing light returns, flooding into the room of the now-blind narrator, and the room begins to spin like an old 78 rpm turntable. The light flickers through the windows at the optimum frequency: "Infinite acres of geometric wallpaper and rubbishy canvases by painters like Vasarely spread all around me. I was the pivot in the center of developing worlds, giant galaxies hurtling through my own inner space at the speed of light . . . Long experience of Gysin's Dreamachine in my Museum's Chapel of Extreme Experience had taught me what to expect. I long ago learned to read these computer images to the point where they turn into dreamlike sequences like holograph movies. I knew I could expect to see the symbols of all the great world religions float free from this background noise to pass slowly and majestically across my field of vision. The cross in all its variations . . . a magnificently jeweled Tibetan *dorje* . . . the all-seeing eye of Isis . . . The crescent moon of Islam or the BVM and the blue hand of Fatima gave way to the symbols of forgotten religions or, who knows, those of other planets. I waited expectantly."

Many of us do. We have all been touched by hallucinatory

experience in some small way. For most people, it occurs only rarely, perhaps manifest solely in the sense of *déjà vu*, the syn-copal interruption which is the most common hallucinatory experience. But once encountered, there is often a desire to return to those strange places and to experience it again, to find what H. G. Wells termed in his account of hallucination, *The Door in the Wall*, that "peculiar passage of escape into another and altogether more beautiful world." But, as Aldous Huxley answered, with a note of benign expectancy not of caution, "the man who comes back through the Door in the Wall will never be quite the same as the man who went out." Gysin had entered the unstable zones, at first briefly, and by accident, but through the scientific investigations of Walter, he found a way to return to those places, a journey he made often. He was not the same man he had been before. Gysin's influence extended beyond his death. He had provided others with an outlet, a means of accessing something, of introducing illumination at the flick of a switch, a means to "get a voyage underway," a means of discovery.

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All along, Ian Sommerville had only ever considered the Dream Machine "a first taste," declaring "more elaborate machines can be obtained." The interest for such devices grew rapidly, and companies vied to find a market for the stimulative possibilities of flicker. In *Mega Brain*, his 1986 book about "new tools and techniques for brain growth and mind expansion," author Michael Hutchison discusses the Dream Machine, and quotes from the "rousingly apocalyptic" text in Burroughs' *The Job*. Hutchison described his experiences with a new invention, the Synchro-Energizer, which utilized "stroboscopic goggles"—rhythmic flashes from small light bulbs surrounding each eye—accompanied by an electronic hum heard through headphones. Users describe experiencing vivid scenes, long-forgotten childhood memories, and brilliant and emotionally charged imagery. Wrote Hutchison: "The visions that appeared to me were vivid, spectac-

ular, of bright primary colors—jagged alien landscapes, narrowing tunnels of looping light, swirling multicolored checkerboards, a realistic view across the gray surface of a pond being stippled into fragmented light patterns by a gentle rainfall, sleek fish moving below the surface.” There were a number of other mechanical devices utilizing flicker on the market. Comptronic Devices Ltd., for example, developed an “audio-visual entertainment device” that sent flashes of light through a pair of eye-sets together with pulses of tones through headphones “to gently guide the brain into altered states of consciousness.” The company’s literature listed “inducing dream states” among its benefits.

It was a pair of such goggles that inspired a new and evocative theory for the source of the stroboscopic patterns. Actually, the groundwork had been laid by John Smythies a quarter of a century earlier, but it was not until a young psychologist happened into a shop selling holistic cures, a head shop of sorts, and saw the goggles for sale, that a way past the façade of order in the patterns to the chaotic mechanisms beyond was found. In 1988, Steven Stwertka was studying neurophysiology and psychology at the Medical College of Georgia, in Augusta, when he came across a set of the goggles in amongst the store’s stock of yoga tapes and alternative therapies. Stwertka had a latent interest in some of the early explorers of altered states, having read Huxley’s *The Doors of Perception* and *Heaven and Hell*, as well as Timothy Leary’s *Psychedelic Experience*. Inquiring about the goggles, he was told that they produced interesting perceptual and psychological effects. While skeptical, he tried the goggles on and almost immediately experienced “a colorful vortex occupying my entire visual field.” Stwertka recognized what the likely mechanism of their action must be, and undertook research summarized in his significant 1993 study, “The Stroboscopic Patterns as Dissipative Structures.”

Dissipative structures are patterns of order that exist solely through the dissipation of energy. They are part of the science of chaos, which holds that behind the oscillations, turbulence, and randomness—the chaos—in nature, there exists a strange manifestation of order and pattern. Dissipative structures are found in

cloud patterns, in the organization of colonies of unicellular organisms, and in the rotating spirals found in chemical reactions. They display certain preferred patterns of organization, many of them the same patterns described in the stroboscopic studies—circles, vortices, spirals, and grids—suggesting what Stwertka described as “an almost universal expression of spatial self-organization and order.” Stwertka’s case was that dissipative structures were also found in the collective organization of neurons in the brain. What is more, he argued that the stroboscopic patterns are merely an elementary manifestation of a more profound and pervasive dynamic of neural organization by which the brain derives pattern and order. When vast aggregates of cortical and sub-cortical neural activity become synchronized, and their activity becomes more coherent and ordered, there emerges from this patterned energy flow the properties of consciousness. It is Stwertka’s suggestion that the organized hallucinations evoked by stroboscopes represent a “macrostate of neural activity . . . the actual content of the hallucination subject to the brain’s personal biography, experience, beliefs, and memory.” In this case, then, through the mechanism of flashing light, it is possible to encounter subjectively the processes of chaos.

Following Stwertka’s postulation, John Smythies returned briefly to the subject of the stroboscopic patterns which he had studied four decades earlier, suggesting stroboscopic light could provide a valuable aid for research into the binding problem, which relates to the fact that while color, shape, and movement are all present in an individual object, these factors are interpreted in three different areas of the brain. The problem then, summarized by Smythies, is “even if there is synchrony between the neurons in these three different areas, how does this synchrony generate the unified phenomenal object?” He noted that in both the geometrical hallucinations when both eyes are stimulated, and the “oily swirl”-type patterns generated when only one eye is stimulated, binding of shape, color, and movement take place, but “they may do so in different ways, as the resulting phenomena are so different.” Smythies suggested stroboscopic light offered a good experimental method of investigating the

problem. Scientific interest in stroboscopic patterns has proven enduring, but so too has the cultural interest.

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Cultural theorist Jean Fisher, in her essay "Truth's Shadows," suggested a link between Brion Gysin's "'dizzying' fall out of rational space-time" and late-twentieth-century developments around the concept of the syncope, expounded upon by the French philosopher Catherine Clément. Syncope is defined in music as a displacement of the beats or accents in a passage, and in medical terms as a temporary loss of consciousness caused by a fall in blood pressure. Fisher suggests Gysin's experiences "coincide rather beautifully with 'syncope'—a momentary loss of breath, a blackout, an ecstatic insight, eclipse of thought, an off-beat that introduces dissonance into a rhythmic flow." In syncope, time is suspended, or as Clément wrote in her 1994 treatise *Syncope: The Philosophy of Rapture*, "time falters," like the subject in Grey Walter's experiments who felt he had been "pushed sideways in time," or the cyclist who "passed out" for an instant when exposed to flickering light, or Gysin's sense of being "swept out of time." Clément observed: "Physical time never stops. That may be, but syncope seems to accomplish a miraculous suspension. Dance, music, and poetry traffic in time, manipulate it, and even the body manages to do that by an extraordinary short circuit." She characterized the phenomenon as an eclipse of rational thought, an ecstatic insight, an off-beat that suspends or more accurately interrupts consciousness and, as Fisher suggests, "anticipates a shift towards 'inspiration', or imaginative invention." Epilepsy is prominent in the story of the syncope, inducing what Clément termed "an apparent death," and then an awakening. But, she argued, syncope is also found in other physical disturbances—like a woman who faints in public, only to be revived with a slap or smelling salts. Her first words will inevitably be, "Where am I?" The real question, Clément argued, since she has just come to, or come back, should be "Where was I?" Except that when an individual

returns from syncope "it is the real world that suddenly looks strange." In *The Aesthetics of Disappearance*, the French theorist Paul Virilio applies the term "picnolepsy" (from the Greek word for frequent) to the minute ruptures in the narrative of consciousness which occur most often in childhood. One moment a child is fully engaged in what is happening around him, in another he is absent, far removed from his surroundings. Virilio suggests that since the child has missed events that those around him believe he has experienced, he is forced to learn early on to simply fill in the void from his imagination: "There is a tendency to patch up sequences, readjusting their contours to make equivalents out of what the picnoleptic has seen and what he has not been able to see." Clément suggested Western society has systematically suppressed syncope, fearing the consequences of the loss of self and the resulting void. Notably, however, she observed that syncopal interruptions are intensifying in contemporary culture, gaining strength and frequency. Wrote Clément: "If classic epilepsy has now fallen to pieces, if it is seeking a cure, the lure of syncope has not ceased; on the contrary, it is renewing itself, modernizing, finding in the urban landscape and modern techniques the necessary food for the disturbing process of devouring time."

Certainly the number of triggers has increased exponentially. No longer consigned to the forests, flicker-fits can be induced by new environmental stimuli such as faulty florescent lights, computer monitors, movies with special effects, video and computer games, flashing lights on emergency vehicles and discotheque lights. Public attention has increasingly focused not on flicker's potential, however, but on the dangers of flicker-induced seizures. Awareness was such that even swimming pools began to be viewed as potential flicker triggers. In his autobiography, *Judgment Day: My Years With Ayn Rand*, Nataniel Branden, an apostle of Rand (author of *The Fountainhead* and *Atlas Shrugged*), and leader of the Objectivist movement of enlightened selfishness which her ideas spawned, describes the death of his wife, Patrecia, by drowning. It was postulated that she had been standing close to the pool in the late afternoon, when

bright sunlight would have been radiating through leaves and off the water of the pool. Wrote Branden: "The result presumably was a 'flicker phenomenon,' a pattern of change in the frequency of light, hitting her eyes, triggering electrically unstable brain cells, and precipitating a seizure." The alarm was sufficient to have reached even the political theater. In 1971, the Greater London Council banned discotheque lights with flicker rates greater than 8 flashes per second. Most other jurisdictions failed to follow its lead. From the Acid Tests to disco dance floors to raves, stroboscopic light has retained its magical properties. This is most at evidence at raves, a dance culture based on repetitive electronic music and methylenedioxyamphetamine (MDMA), an empathogen known as Ecstasy which intensifies sensory perceptions manifested in spectacular light shows driven by strobe. Even the dances feature twitches and jerks reminiscent of an epileptic seizure. Because of the innocent-making effects of Ecstasy, raves also assumed the aesthetic of juvenalia, with circus-like side shows at some raves including Mind Machines—goggles which, like the Synchro-Energizer, pulse a strobe directly into the eyes of the wearer. The paraphernalia of ravers also included lightsticks, hand-held electronic strobes, flashing belly lights and other pulsing lights worn as fashion accessories.⁵⁰ The combination of Ecstasy, strobe and the trance-like music produced an ecstatic state that seemed to suspend time, a state that the techno-pop band The KLF captured in "3 AM Eternal."

In 1990, in the British House of Commons, MP David Shaw raised a further alarm over the sale of devices that generate stroboscopic light, asking the government to issue a statement about "the potential dangers to health . . . from the use of consumer products which can produce flicker or stroboscopic light sources with a flicker rate in excess of five flashes per second." The government's considered response was that such devices did not pose a "general threat to safety." While a rare condition, concern about photosensitive epilepsy has continued to increase as the inventory of suspected triggers has grown. Clinical cases have been published widely in scientific and med-

ical journals. New conditions, such as "television epilepsy" and "video game epilepsy" have been identified. In some of these articles, W. Grey Walter's pioneering work is cited. One British study investigated 143 cases of photosensitive epilepsy over a six-month period, of which 23 (16 percent) were traced to electronic video games, and another 23 were traced to TV. Other computer graphics or electronic screens were identified in 12 cases (8 percent). In about half the cases no obvious trigger could be found, although some of them were thought to have been provoked by sunlight. After several teenagers suffered seizures while playing Nintendo video games, the company began to include warning information with its Game Boy products saying the games could cause a "shigeki," or strong stimulation, from bright flashing lights, producing various undesirable symptoms. In 1993, a British TV commercial for Pot Noodles which featured bright flashes and shifting graphics induced seizures in three viewers. After an investigation, the Independent Television Commission, the regulatory body for the country's commercial broadcasters, established guidelines prohibiting flashing lights or flickering images at more than three flashes per second, and indicating repetitive "psychedelic" patterns should be avoided.

The most dramatic manifestation occurred, however, on Tuesday, December 16, 1997, when Japanese schoolchildren, and some adults, tuned in to watch an episode of the animated TV series *Pocket Monsters* (contracted to *Pokémon*), the country's highest rated series in the 6:30 P.M. slot. Broadcast simultaneously on thirty-seven stations, it is estimated 10 million people were watching that evening. *Pokémon* is based on a Nintendo video game which had been transformed into a cultural phenomenon by the "largest marketing effort in the history of toys." The episode called "Computer Warrior Polygon" featured the characters fighting inside a computer. At 6:51 P.M. viewers were watching a scene where vaccine missiles were launched to destroy a computer virus, followed by "a bizarre, flashing explosion with high frequency red and blue flicker stimulation" which occupied the whole screen, alternat-

ing at twelve flickers per second. Suddenly, some of the viewers went into a trance-like state, as if they had been hypnotized. Others experienced altered vision, and shortness of breath. Some passed out, while others experienced seizures. Hospitals all over Japan received admissions, although most of the patients were home before midnight. In all, some 12,000 viewers reported some disorienting symptoms after watching the original episode, or the "highlights" when they were helpfully rebroadcast by some TV news programs later the same evening. Of those, 685 Japanese children and adults suffered seizures. The incidence was minute compared with the total numbers of viewers, but it was still the largest ever single occurrence of flicker-induced symptoms. Ryutaro Hashimoto, the Japanese prime minister, only added to the general confusion when he responded to the incident by observing: "Rays and lasers have been considered for use as weapons. Their effects have not been fully determined." A Research Committee on Photosensitive Attack was subsequently established by Japan's Ministry of Welfare and Health, and it concluded that changes in luminance, color and pattern were responsible for the phenomenon, although mass hysteria inflated the numbers. None of the researchers investigated the possibility that symptoms may have been evoked that were neither injurious nor frightening. Indeed, for a vastly greater proportion of viewers the contrary may have been true as a large market for bootleg tapes of the flashing light episode developed among fans around the world, and the clip was featured on a number of Web sites.

Italian scientists, in a paper in *Nature Neuroscience*, predicted that the phenomenon would only increase with the proliferation of triggers, suggesting the mechanism of stroboscopic light will have an enormous impact on human consciousness in the centuries to come.

Notes

- ¹ For this and other biographical information about W. Grey Walter, see Rhodri Hayward, "The Tortoise and the Love-Machine: Grey Walter and the Politics of Electroencephalography," *Science In Context* (2002).
- ² Plan for the Study of the Physiology of Mental Events, Burden Neurological Institute, Bristol, December 1951. Rockefeller Archive Center, RF1.1/401A/210.
- ³ RSM Interview, Burden Neurological Institute, Bristol, 11 July 1949. Rockefeller Archive Center, RF1.1/401A/209.
- ⁴ Dostoyevsky also described an aura of rapture before an epileptic seizure: "For some moments, I have a feeling of happiness that I never experience in my normal state and that is hard to imagine. It is a complete harmony in me and in the whole world, and this feeling is so sweet, so strong, that I assure you, I would give ten years of my life—even my whole life—for a few seconds of that joy." Cited in Catherine Clement, *Syncope: The Philosophy of Rapture* (Minneapolis: University of Minnesota Press, 1994), 10.
- ⁵ Reginald Bickford, letter to W. Grey Walter, 29 April 1948, Science Museum, London.
- ⁶ Sanford J. Freedman and Patricia A. Marks, "Visual imagery produced by rhythmic photic stimulation: Personality correlates and phenomenology," *British Journal of Psychology* 56 (1965).
- ⁷ C.G. Jung, letter to John R. Smythies, 4 February 1952, Reynolds Historical Library, University of Alabama at Birmingham, in J.R. Smythies, "The impact of psychedelic drugs on philosophy and psychological research," *Journal of the Society for Psychical Research* Vol. 52 (1983).
- ⁸ John Smythies, "The Adrenochrome Hypothesis of Schizophrenia Revisited," *Neurotoxicity Research* Vol. 4 (2) (2002).
- ⁹ Aldous Huxley, letter to John R. Smythies, 1 March 1953, in J.R. Smythies, "The impact of psychedelic drugs on philosophy and psychological research," *Journal of the Society for Psychical Research* Vol. 52 (1983).
- ¹⁰ Georg Luck, "Theurgy and Forms of Worship in Neoplatonism," in Jacob Neusner, Ernest S. Frerichs and Paul Virgil McCracken Flesher, *Religion, Science and Magic* (New York: Oxford University Press, 1989).

- ¹¹ Abram Hoffer and Humphry Osmond, *The Hallucinogens* (New York: Academic Press, 1967).
- ¹² Daniel Redwood, "Frontiers of the Mind: Interview with Stanislav Grof, MD," Health World Online, www.healthy.net.
- ¹³ C.D. Broad, letter to John Smythies, 12 October 1955, Reynolds Historical Library, University of Alabama at Birmingham.
- ¹⁴ Bernard Quatermass, protagonist in a BBC science fiction television and later Hammer Films series of the 1950s and 1960s, written by Nigel Kneale. Quatermass, a British government rocket scientist, confronted alien lifeforms. The 1967 film *Quatermass and the Pit* was released successfully in North America as *Five Million Years to Earth*.
- ¹⁵ C.D. Broad. Transcription of four sessions of stroboscopic light. Experiments conducted by J. R. Smythies, Psychological Laboratory, Cambridge, 1956.
- ¹⁶ Brion Gysin, interview with Jason Weiss, in *Reality Studios* Vol. 4 (1982).
- ¹⁷ For an account of Brion Gysin's childhood in Alberta, see John Geiger, in Herve Binet, ed., 23: *Brion Gysin* (Caen: I.C.B.M/23/editions Cactus, 1993). Also, John Grigsby Geiger, "Wrong Time, Wrong Place, Wrong Colour," in Bob Hesketh and Frances Swyripa, eds., *Edmonton: The Life of a City* (Edmonton: NuWest, 1995).
- ¹⁸ Brion Gysin's recipe for Hashish Fudge: Take 1 teaspoon black peppercorns, 1 whole nutmeg, 4 average sticks of cinnamon, 1 teaspoon coriander. These should all be pulverized in a mortar. About a handful each of stoned dates, dried figs, shelled almonds and peanuts: chop these and mix them together. A bunch of cannabis sativa can be pulverized. This along with the spices should be dusted over the mixed fruit and nuts, kneaded together. Almost a cup of sugar dissolved in a big pat of butter. Rolled into a cake and cut into pieces or made into balls about the size of a walnut, it should be eaten with care. Two pieces are quite sufficient. Alice B. Toklas, *The Alice B. Toklas Cook Book*, (Garden City, N.Y.: Anchor, 1960).
- ¹⁹ Alice B. Toklas, letter to Brion Gysin, 26 February 1952, McFarlin Library, University of Tulsa.
- ²⁰ William S. Burroughs, letter to Allen Ginsberg, [1959?], Columbia University Rare Book and Manuscript Library.
- ²¹ William S. Burroughs, letter to Timothy Leary, [1960?], in Timothy Leary, *High Priest* (New York: World Publishing Co., 1968).
- ²² Brion Gysin, letter to Timothy Leary, 23 February 1961, www.leary.com. Leary's reply: Timothy Leary letter to Brion Gysin, 13 March 1961, www.leary.com.
- ²³ Gysin was referring to a broadcast of his permutative poem, "I AM THAT I AM," recorded for the British Broadcasting Corporation by Douglas Cleverdon, who had also produced the acclaimed reading of

- "Under Milk Wood" by Dylan Thomas. Gysin had stumbled on permutations when he read the divine tautology "I AM THAT I AM" in an appendix to Aldous Huxley's *Heaven and Hell*. The title of God is given as "I am" in the Old Testament, Exodus 3:14: "And God said unto Moses, I AM THAT I AM: and he said, Thus shalt thou say unto the children of Israel, I AM hath sent me unto you." Gysin's recording took the poem through its full cycle of permutations—I AM THAT I AM/AM I THAT I AM/I THAT AM I AM/THAT I AM I AM . . . When the program appeared, it was broadcast, Gysin noted with pride, "to the second lowest rating of audience approval registered by their poll of listeners."
- ²⁴ Brion Gysin, Notebook 1977, Ohio State University Libraries, Rare Books and Manuscripts, Folder 349.
- ²⁵ Allen Ginsberg, letter to Timothy Leary, April 1961, in Timothy Leary, *High Priest* (New York: World Publishing Co., 1968).
- ²⁶ Timothy Leary, *High Priest* (New York: World Publishing Co., 1968).
- ²⁷ William S. Burroughs, letter to Brion Gysin, n.d., in Ted Morgan, *Literary Outlaw* (New York: Avon Books, 1988).
- ²⁸ Brion Gysin, Notebook 1977, Ohio State University Libraries, Rare Books and Manuscripts, Folder 349.
- ²⁹ Allen Ginsberg, letter to Peter Orlovsky, 2 August 1965, in Winston Leyland, ed., *Straight Hearts' Delight* (San Francisco: Gay Sunshine Press).
- ³⁰ Brion Gysin, letter to Charles Henri Ford, 20 January, 1963, Harry Ransom Humanities Research Center, University of Texas at Austin.
- ³¹ Minutes of a meeting about the Dream Machine, December 1964, Collection of Leila Hadley Luce.
- ³² Leila Hadley, letter to Brion Gysin, 2 December 1965, Collection of Leila Hadley Luce.
- ³³ Jetta Bernier, "The Flicker Phenomenon," unpublished mss., 1969.
- ³⁴ Brion Gysin, letter to Peter H. Matson, 17 June 1966; Peter H. Matson, letter to Brion Gysin, 27 June 1966; Peter H. Matson, letter to Brion Gysin, 25 July 1966, Columbia University Rare Book and Manuscript Library.
- ³⁵ Richard Condon and Michael Mason, "The Dream Machine," unpublished mss., 1966.
- ³⁶ Brion Gysin, letter to Peter H. Matson, 4 June 1968, Columbia University Rare Book and Manuscript Library.
- ³⁷ Michael Cooper, Terry Southern and Keith Richards, *The Early Stones* (New York: Hyperion, 1992).
- ³⁸ Paul Bowles, letter to Charles-Henri Ford, 18 March 1967, in Jeffrey Miller, ed., *In Touch: The Letters of Paul Bowles* (New York: Farrar, Straus and Giroux, 1993).
- ³⁹ Bill Willis, interview with John Geiger, 16 February 2001.
- ⁴⁰ Brion Gysin often listened to the music of the Master Musicians of Jajouka while viewing the Dream Machine. He later also described side two of *Heathen Earth* by Throbbing Gristle as a perfect soundtrack for

the Dream Machine, saying he was amazed at the perfect interlocking with his visions.

- ⁴¹ William S. Burroughs, interview with John Geiger, 4 February 1994. Also: Brion Gysin, "FIRE: Words by Day, Images by Night," *Soft Need* #17 (1977).
- ⁴² The Pink Floyd song referred to was "Another Brick in the Wall (Part 2)" from *The Wall*. The study cited is Joseph Glicksohn, "Photic driving and altered states of consciousness: An exploratory study," *Imagination, Cognition and Personality* 6(2) 1986–87.
- ⁴³ Alan Richardson and Fiona McAndrew, "The effects of photic stimulation and private self-consciousness on the complexity of visual imagination imagery," *British Journal of Psychology* 81 (1990).
- ⁴⁴ See: Ian Cotton, "Dr. Persinger's God Machine," *The Independent on Sunday*, 2 July 1995.
- ⁴⁵ Susi Wyss Versa, in Herve Binet, ed., 23: *Brion Gysin* (Caen: I.C.B.M/23/editions Cactus, 1993).
- ⁴⁶ William S. Burroughs, letter to Brion Gysin, 11 February 1976, Ohio State University Libraries, Rare Books and Manuscripts, Folder 357.
- ⁴⁷ Simon Ford, *Wreckers of Civilisation: The Story of COUM Transmission and Throbbing Gristle* (London: Black Dog Publishing, 1999).
- ⁴⁸ Brion Gysin, interview with Carol Anderson, 1 June 1985, unpublished mss.
- ⁴⁹ Ned Rorem, *The Nantucket Diary of Ned Rorem 1973–1985* (San Francisco: North Point Books, 1987).
- ⁵⁰ Communication from Mireille Silcott, author of *Rave America: New School Dancescapes* (Toronto: ECW Press, 1999) and (with Push) *The Book of E: All About Ecstasy* (Toronto: Omnibus Press, 2000). See also: *Simon Reynolds Energy Flash* (London: Picador, 1998).

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