

"Excellent . . . engrossing . . . Geiger's readable, authoritative, beautifully designed pocket history does us all a great favor by reminding readers of what is wondrous in life." —*Quill & Quire*

"It's unlikely you'll find a more fascinating book. The convergence of science and art, of great minds and visionaries, over a hallucinatory device is one of the fantastic untold stories of our century. Geiger's slim but potent book is a sizable contribution to the annals of science and pop culture." —*Calgary Herald*

"For the first time, out of a kaleidoscopic cyclone, a blizzard of revolutionary scientific information and ultra-visionary creation, John Geiger has cut-up and exposed the last remaining and most significant creative and conceptual exploration of consciousness." —Genesis P-Orridge

"Absolutely, unequivocally wonderful histoire. Fascinating. If I had a Dream Machine now I'd just sit all day with closed or open eyes in front of it." —Leila Hadley

"Wholesome in a bizarre way" —*National Post*

The true story of how the discovery of flicker potentials, and scientific observations about strange patterns, organized hallucinations, and even the displacement of time derived from stroboscopic light, very nearly resulted in a Dream Machine in every suburban living room. William S. Burroughs said: "Flicker administered under large dosage and repeated later could well lead to overflow of brain areas . . . Anything that can be done chemically can be done in other ways." Aldous Huxley called it "an aid to visionary experience."



Soft Skull Press | www.softskull.com
Distributed by Publishers Group West
ISBN 1-932360-01-8 | \$11.95

USA
2517

Chapel of Extreme Experience

John Geiger

Chapel of Extreme Experience

A Short History of Stroboscopic
Light and the Dream Machine

John Geiger

BCU - Lausanne



1096544835

159
.91

Copyright © 2003 John Grigsby Geiger
www.johngeiger.net

Cover Photograph: © 1972/2003 Charles Gatewood,
www.charlesgatewood.com

Distributed in the US by Publishers Group West
www.pgw.com | 1-800-788-3123

Printed in Canada

Soft Skull Press
71 Bond Street
Brooklyn, NY 11217
www.softskull.com

Library of Congress Cataloging-in-Publication Data for this
book is available from the Library of Congress



Foreword

I first met Brion Gysin and saw the Dream Machine, created by Ian Sommerville and himself, in operation at an art gallery in Tangier, Morocco, on a hot and humid August evening in 1964.

Several people stood around the Dream Machine, a white cylinder about a meter in height, its interior lit by a 100-watt light bulb so that light shone from slots shaped like long-stemmed tulip buds incised around it.

As the Dream Machine spun slowly on a turntable, Brion Gysin explained that it produced stroboscopic pulses of light at a rate which corresponded to the alpha band of some eight to thirteen flickers per second.

"It's the first art object to be seen with the eyes closed," Brion said. "Just get up close, the close your eyes, and wait for a few minutes. You see kaleidoscopic visions and gorgeous patterns as the light flickers over your eyelids."

At that moment, I was more interested in Brion than the Dream Machine. I'd been told he was an artist, a writer, a poet, a lyricist, a linguist, a musician, a fabulous raconteur, the owner of the 1001 Nights restaurant, a well-traveled fearless adventurer, a polymath. So many of him, so few of everyone else. He was forty-eight years old, tall, with a ruddy complexion, hair the color of strong tea, a beak-like nose. His long, wide eyes were an astonishing blue—clear, intense, mesmeric. Once seen, you could never forget the way Brion looked.

I stood as close as I could to the Dream Machine and closed my eyes. Within two or three minutes, I was amazed when the brilliantly colored geometric patterns flowed across my eyes. A Greek key design, circles that became squares, rectangles, arcs, vertical panels of red, blue, purple, acid green, orange, yellow, colors so intense that they were neon bright, but as richly tex-

A/296815

tured as velvet, curtains of color circling into splashes of primary colors, dark, light, then shocking pink, mosaics like sunlit stained glass. When I opened my eyes, I forgot the heat. I felt cool. Everything and everyone appeared clear, fresh, sharply defined.

People were beginning to leave. When I found Brion to talk with, he suggested I might like to stop by the place he was living where he could show me a notebook filled with small paintings of Morocco which might be more interesting to me than the printed cut-up poems and calligraphic paintings on view at the gallery.

Of course, I said, but I was now absolutely besotted with the Dream Machine. What did it cost? Where could I get one?

Over tumblers of sugary hot tea stuffed with mint leaves, Brion told me that the Dream Machine on display was the only one he had plus a few more cylinders with a variety of slotted cut-outs. None had been made commercially- he had hoped they could. Perhaps they would be able to be made in America.

Well, of course. I was sure he could easily find all sorts of people to invest in the Dream Machine, have it made in quantity, distributed, sold.

I was working as an editor on a magazine. I invited Brion to bring the Dream Machine to New York and plan to stay for a while at my apartment to give him time to have the Dream Machine manufactured and sold.

Brion came to New York in December 1964. I spent hours looking at the Dream Machine with my eyes closed and with my eyes open.

As the Dream Machine revolved at 78 rpm, the large patterns I saw with my eyes closed became smaller when the cylinder spun at 45 rpm and smaller still at 33 rpm, both smaller and quicker to change shapes. At all speeds, the colors were extraordinarily vivid, the patterns ever fascinating in their variety. Waves of color curtaining my eyelids would form into curving bands and spirals, change into wheels of peacock blue, gas jet blue, then scarlet, emerald green, orange, purple drums would roll across my closed-lidded vision from left to right to

recycle into panels and trees and hills and waves of color in glowing jewel colors, a sensation that was stimulating, comforting, refreshing, satisfying.

Brion told me that I would see scenes peopled with real-life figures if I looked at the Dream Machine with my eyes open. "Like hallucinating without drugs," he said. I was skeptical.

It took longer to see images than it had to see vivid patterns, but the first images I saw captivated me. I saw a Palladian villa with black women in white aproned-floral print dresses gliding through a pillared atrium with pyramids of fruit and flowers heaped on trays balanced perfectly on their heads. Years later, I remembered this image when I saw Balinese women in Ubud carrying offerings on their heads to a temple. I saw white horses, red parrots, and a black panther in a field of forget-me-nots. I saw rivers, lakes, boats, castles, people. I never knew what I would see, nor did I ever see anyone I knew, although other people told me they often saw friends, family, familiar faces.

After watching images come and go, I would feel singularly clear-headed, aware, serene, and often as though I had 360° vision.

Psychedelic events were happening all around New York at the time. Kaleidoscopic machines whirled and flickered and projected colored slides across the ceilings of bars and clubs, as well as changing patterns of colored light on the walls of discothèques, but there was nothing, nowhere, nonesuch that came close to the fascination of the Dream Machine.

Leaving the Dream Machine to go to work as a magazine editor was an effort of discipline and will, as well as a financial necessity.

Neither Brion nor I had the money to get the Dream Machines commercially manufactured.

Everyone who saw the Dream Machine demonstrated—and there were scores who did—enjoyed the experience, but potential investors were undecided. Was the Dream Machine a commercial venture? Could it be sold as an art object? A novelty? A decorative object?

Brion and I, who found the Dream Machine an unfailing pleasure, a source of wonder and beauty, were mystified at our lack of success in converting it into a commercial object. We continued to watch it with eyes shut and with eyes open. We experimented with increasing the wattage of the source of light and with painting colored patterns in the cylinder inside it.

No matter what Brion approved of doing, the Dream Machine was always a mystical experience, unstaled by familiarity.

To have experienced the Dream Machine was a superb privilege I have never stopped longing to know again.

Leila Hadley

NEW YORK

Introduction

This book tells the fascinating story of how a visual phenomenon first described two hundred years ago by the physiologist Jan Purkinje has become the basis of further scientific studies into how the visual brain works, and how its repercussions have spread widely into contemporary artistic and musical culture. If the eye is stimulated by a flickering light the visual field becomes filled with a wide variety of hallucinatory geometrical patterns, as well as, in some cases, more formed scenes. Various emotional reactions can also occur. Such a stimulus also potentiates the effects of hallucinogenic drugs like mescaline.

John Geiger traces the historical development of the purely scientific studies in which Grey Walter and I played early roles and to which Steven Stwertka has made a recent notable contribution. Geiger then describes the role played by Aldous Huxley in bringing the mescaline phenomena to the attention of the world in his book *The Doors of Perception*. In the sequel *Heaven and Hell*, Huxley commented on the role of flicker in potentiating, even initiating, these phenomena. The transition to the art world was pioneered by Brion Gysin, William S. Burroughs, and Allen Ginsberg. Geiger also traces the efforts of these people and others to make simple machines, for example the Dream Machine and the Synchro-energizer, which could be used in place of the expensive electronic stroboscope to elicit these experiences. He also recounts the interest started by Grey Walter, with the support of Eileen Garrett, in using flicker in ESP experiments. Recently the philosophical implications of these phenomena have been explored by Jean Fisher.

Artists and scientists have always been interested in exploring the transcendental worlds that expansion of normal

consciousness leads to. The use of flicker represents a safe and effective ticket for this journey. The flicker phenomena also present an unsolved puzzle for visual science. We still do not know how the brain mechanisms produce these patterns. Grey Walter suggested that they provide evidence for the operation of TV-like scanning mechanisms. Stwertka has suggested that they are the result of chaotic mechanisms. Only further research will solve this very important question. I hope that this excellent book will encourage researchers to take up this challenge.

John R. Smythies

CENTER FOR BRAIN AND COGNITION
UNIVERSITY OF CALIFORNIA, SAN DIEGO
AND INSTITUTE OF NEUROLOGY
UNIVERSITY OF LONDON

Chapel of Extreme Experience

Among the crowd at an exhibition opening at Galerie von Bartha, Basel, in June 1979, were two men who might easily have been mistaken for art collectors. They made their way around the exhibition of drawings and sculptures, sipping white wine, and occasionally interrupting the incumbent niceties to stare closely and intently—but with closed eyes—at one of the objects. The sculptures were tall, spinning, silver or black cylinders pierced with irregular shapes. A light inside each produced an eerie flicker which lay like a patterned quilt on their faces. One of them, a pallid man of sixty-five in a grey suit, with fiercely intelligent eyes and thin lips, which he pursed habitually, was recognizable from his likeness on the jackets of hardcover books. He was William S. Burroughs, a legendary figure equally in American letters and drug culture, who in 1959 had published his hallucinatory novel *Naked Lunch*. Burroughs had traveled from New York for the opening. The second man, still more conservatively attired, with closely-cropped white hair, and older at seventy-three, had traveled only a few kilometers from his home outside Basel. He was Dr. Albert Hofmann, the author of another hallucinatory product. A retired chemist for Sandoz Laboratories, Hofmann had synthesized lysergic acid diethylamide (LSD) in 1938. Its unusual properties were not fully understood until 1943 when he accidentally absorbed a small dose through his fingertips, and experienced “an intense stimulation of the imagination and an altered state of awareness of the world.” The artist was also present at the opening. He was a tall and handsome man of sixty-three, with a ruddy face, wearing an ornately embroidered Moroccan vest. Brion Gysin

was at once charming and solicitous, moving seamlessly among prospective clients in pearls, and young Beat camp followers, all the while gathering up appreciations as assiduously as an oriental potentate might accept tribute.

The exhibition was called "Dreamachines," and in its report about the event, a local newspaper, the *Basler Zeitung*, described Burroughs, Hofmann and Gysin as "dream mechanics." It was a fitting appellation. This was not an ordinary art show, and what was on display was not conventional artwork. The sculptures were actually flicker machines, finely calibrated to expose the viewer to rhythmic flashes of light at the rate of eight to thirteen per second, stimulating the brain's alpha rhythms and inducing illusory experience similar to that produced by LSD. Burroughs described flicker as "consciousness-expanding," and had proclaimed famously that "anything that can be done chemically can be done in other ways." Gysin's Dream Machine offered another way. It was the product of a period of intensive scientific investigation into the borderlands between dreams and waking thought, which revealed that, through the medium of flashing light, it is possible to evoke colors, patterns, simple sensations, complex organized hallucinations involving more than one sense, perceived changes in body shape, and even the displacement of time. The mechanism of stroboscopic light allows one to gain access to a place suffused with what Aldous Huxley termed "preternatural significance." Flicker is, Huxley wrote in an appendix to his 1956 book, *Heaven and Hell*, "an aid to visionary experience." How it stimulates such a response is, he argued, part of a "comprehensive mystery—the nature of the relations between visionary experience and events on the cellular, chemical and electrical levels." Huxley was intrigued to learn that stroboscopes could act on their own to evoke illusory experience, or could "enrich and intensify" visions induced by drugs such as mescaline and LSD. Unlike such hallucinogenic agents, however, the necessary conditions for flicker can occur spontaneously in everyday life.

Two years after Huxley published his ruminations on flicker, on December 21, 1958, Gysin, a painter and writer, and at the time a resident of the Beat Hotel in Paris, momentarily and unexpectedly entered the place where "the visual merges with the visionary." Gysin was traveling by bus from Paris to La Ciotat, an artists' colony on the Mediterranean, near Marseilles, to spend the Christmas and New Year holidays with friends. As the bus passed through a long avenue of trees Gysin, closing his eyes against the setting sun, encountered "a transcendental storm of color visions." He recorded the experience in his journal: "An overwhelming flood of intensely bright patterns in supernatural colors exploded behind my eyelids: a multi-dimensional kaleidoscope whirling out through space. I was swept out of time." The phenomenon ended abruptly as the bus left the trees. "Was that a vision? What happened to me?" asked Gysin. The flicker experience recalled the first films he had seen as a child in Alberta in the 1920s, films using the often explosive silver halide base which gave a "magic light to the film, a flickering shimmer cut stroboscopically by the frames of each image." Gysin immediately wrote Burroughs, a close artistic collaborator, with an account of his fall out of rational space. Burroughs replied portentously: "We must storm the citadels of enlightenment. The means are at hand." The means, Gysin determined, would be to develop a machine to harness the visionary potential of flicker, a device that would make illusory experience available at the flick of a switch: a Dream Machine.

• • •

The origins of flicker, and its relationship with visionary experience, are ancient. "The knowledge that a flickering light can cause visual hallucinations is something humans have known since the discovery of fire," observed Michael Hutchison, whose book *Mega Brain* is a popular study of the brain's potential. A man of immense scholarship and culture, Gysin recognized that

the type of vision produced by flicker had historical precedents: "One knows of cases—in French history, Catherine de Medici for example, had Nostradamus sitting on the top of a tower . . . [he would] flicker his fingers over closed eyes, and would interpret his visions in a way which were of influence to her in regard to her political powers . . . they were like instructions from a higher power . . ." Gysin suggested Saul of Tarsus—St. Paul—the most important convert to Christianity, may have encountered the flicker phenomenon on the road to Damascus, where, according to the Bible, "a light from heaven flashed around him." Gysin, who himself felt he had undergone some kind of spiritual experience, noted that: "One of the first things you do see are crosses."

It was the Bohemian experimental physiologist Jan E. Purkinje who in 1823 first described the subjective effects evoked by flicker. Purkinje was a fascinating figure of his time. He established five categories of vertigo, was a poet, Freemason, political activist named on a list of "political compromised individuals" by the Hapsburg rulers, and was a disciple of the poet Johann Wolfgang Goethe, who wrote admiringly of Purkinje's experiments with vision. Purkinje discovered flicker patterns when he looked up towards the sun and, with eyes closed, passed his fingers rapidly back and forth over his eyelids, and also when he looked through the spokes of a rotating wheel. He recorded well-structured patterns, checker-board arrays, shifting zig-zag lines, a rose-leaf pattern, repetitive cross-shaped figures, and secondary images such as an eight-rayed star and a spiral. Purkinje's observations stimulated a series of reports of patterns produced by different methods. He described exerting moderate pressure on the eyeballs using the tips of the fingers, with the result that in "a short space very brilliant and variable luminous patterns will appear in the visual field, which execute curious and fantastic movements, frequently not unlike the most gorgeous kaleidoscopic figures." He carefully documented the resulting patterns such as star-shaped structures, checkerboards and honeycombs. H.

Helmholtz refined Purkinje's descriptions of phenomena produced both by flicker and by pressure images. He observed that flicker produced a rosette surrounded by irregular spots, while pressure on the eyeball produced a weaving, maze-like pattern, and a finely patterned field of diverse color, which appeared strewn with fine leaves or moss. Early explanations of the stroboscopic patterns were formulated by scientists E. Thompson and L. Wolffberg, in 1919 and 1886 respectively, who theorized that the perceived images resulted from visualizations of corneal structures and shadows cast by retinal blood vessels, and the geometric patterns were the product of the "spatial organization of retinal physiology."

G. T. Fechner, and later investigators studying the colors produced by Charles E. Benham's Artificial Spectrum Top, also noted patterns, such as hexagonal figures, grids, and mosaics, produced by intermittent illumination. Benham's top was the first man-made object to produce pattern-induced flicker colors manufactured for consumers. It was a successor to both a line of devices that used light for entertainment as well as nineteenth-century optical toys. An early example of this is the Magic Lantern, an apparatus invented in the seventeenth century which first employed fire and later electricity to illuminate slides in complex, moving displays. Later toys, such as Purkinje's 1841 invention of the Kinesiskop, a machine that used successively perceived images to create the impression of moving scenes, and similar devices, Stampfer's 1833 Stroboscope and William George Horner's 1834 invention, the Zoetrope, are considered to be precursors to motion pictures. The Zoetrope had slots cut into a cylinder, which was supported by a central axis. Images drawn on strips of paper, such as a gentleman astride a donkey, or a man eating a rat, were placed inside the cylinder. When spun, Horner noted, the cylinder "appears to be transparent," and the stroboscopic effect on the image strips created illusions of motion based on persistence of vision, the eye's capacity to retain an image for roughly $\frac{1}{20}$ of a second after the object is gone. Benham's top went a step fur-

ther, producing illusions not of motion but of color, as the color signaling system of the retina is confounded by time-spaced flickers of black and white. The device excited considerable interest when its curious properties, and Benham's theory that "the colors of the top are 'artificial' sensations," were published in the journal *Nature* in 1894. The top consisted of a cardboard disc about 10.8 centimeters (4¼ inches) in diameter, mounted on a spindle. One half of the disc was black, the other white with arcs of concentric rings drawn on it. When the top was rotated, it was described as furnishing "an interesting phenomenon to students of physiological optics." Instead of grey rings produced from the blurring of black and white, the top produced colors, the nature of which depended on the speed of rotation, and the intensity of light it was viewed under. Not only did Benham's top, sold by Messrs. Newton and Co., become a popular children's toy—making flicker in its most rudimentary form available to a mass audience—but the illusions of color came under close scientific scrutiny, and became a tool for investigations of the human visual system. In 1897, Shelford Bidwell, a Fellow of the Royal Society, presented the results of his experiments with Benham's top. Bidwell invented the first power-driven flicker machine utilizing both power and light, mounting the disc on a horizontal axis, "driven by an electro-motor, and the speed regulated by comparison with the ticks of an ordinary watch." He then placed the device in a box, where it was illuminated with an electric light bulb of eight candle-power. When Bidwell gazed in at the spinning disc through a small aperture, he found "several curious phenomena appeared simultaneously."

From Benham's top emerged not only investigations of purely optical phenomena, but recognition of the deeper potential of the brain's flicker response. In 1934, E. D. Adrian and B. H. C. Matthews, of the Physiological Laboratory, Cambridge, published the first observations of flicker potentials in the scientific journal *Brain*. In their experiments, Adrian and Matthews had subjects sit with their eyes at the center of an opaque glass bowl,

and their heads covered by a black velvet curtain. The convex surface of the bowl was then lit by a 30-watt automobile headlight bulb placed one foot away. The light shone through a variation of Benham's disc, a wheel with wide spokes creating eight equal intervals of light and dark, powered by a gramophone motor. The subject viewed the bright flickering light with eyes open, and the researchers used a Matthews ink-writer oscillograph to record brain rhythms, which are divided into categories, like alpha and theta, according to frequency. Using this method, they demonstrated the existence of the alpha waves, brain rhythms of eight to thirteen cycles per second. Significantly, they concluded that alpha rhythms could be provoked by sensory stimulation. These electrical rhythms were shown to be generated by the visual projection areas of the brain, and were related to spontaneous alpha rhythms which occur naturally in resting individuals, when the mind is in a state of relaxed receptivity, "searching for pattern." Additionally, they found that flicker resulted in a vision field "filled with colored patterns."

It was in 1946 that Dr. W. Grey Walter introduced the electronic stroboscope to psychophysical experimentation. While acknowledging his debt to Benham, Walter argued the technical limitations of the traditional rotating wheels produced subjective sensations that "are not particularly vivid." Using high-power stroboscopes, and experimenting with trigger-feedback techniques where the flash was set to fire in synchronization with, or at any chosen time in relation to, the spontaneous or evoked activity of the brain's rhythms, he produced startling results. The effect of photic stimulation is to "modulate" the intrinsic brain rhythms so that in a sense the brain "is transformed temporarily into a different sort of brain." With Scopphony Ltd.'s stroboscope flashing into closed eyes, at frequencies up to the flicker fusion frequency—the point where the flashes appear to merge into steady light—Walter found that "strange patterns, new and significant, emerged." At four to seven flashes per second, the frequency of the theta rhythm, which is prominent

in childhood but barely present in good-tempered adults, the stroboscope could evoke feelings of annoyance and anger. But it was flicker at the frequency of the alpha rhythm, eight to thirteen flashes per second, that most interested him. He discovered that stroboscopic light appeared to break down some of the physiological barriers between different regions of the brain. Wrote Walter: "Flicker proved to be a key to many doors."

• • •

Born in Kansas City, Missouri, in 1910, William Grey Walter was the son of an American mother and an English father who was city editor of the *Kansas City Star*, but who returned to Britain to serve in Intelligence during the First World War. Walter was raised in Britain from age seven, studied at Cambridge and became head of physiology at the Burden Neurological Institute in Bristol. His flair for discovery invited comparisons to nineteenth-century scientists, although his unconventional character alienated many of his professional colleagues. He carried out pioneering research in cybernetics, experimenting with robot "tortoises" in an effort to understand brain function. He developed a commercially successful Automatic Brain Analyzer after it first appeared to him in a dream. He authored a science fiction novel, *Further Outlook*. He was also a glider pilot, "home guard explosive expert, wife swapper, TV pundit, experimental drug user, and skin diver."¹ His personal life was sufficiently interesting to have provoked the director of the Institute to hire a private detective to investigate.

The Burden Neurological Institute undertook groundbreaking research into psychiatric illness, including conducting the first leucotomy (surgical cutting of white nerve fibers in the brain) and electro-convulsive therapy in Britain, controversial treatments which Walter championed. Walter worked extensively with the Electroencephalograph, or EEG, an instrument that records minute electrical oscillations associated with brain

activity which he called "brain-prints." He also helped develop the Toposcope, an instrument which permitted the simultaneous evaluation of many different brain areas exposed to flicker stimulation, and which he said bore the same sort of relationship to a conventional EEG as "a mosaic of aerial photographs has to a traveler's tale." Walter increasingly saw a role for such technology in human society. He even raised the possibility of neural/social engineering experiments, noting that differences in the EEG readings for juvenile delinquents and adherents of extremist creeds raised the possibility of identifying "the presence in the 'normal' population of a class of potential offenders characterized by these aberrant features."² He was a committed proponent of practical applications for the EEG, and used the instrument in the defense of an epileptic who had murdered a Brighton schoolgirl during a seizure. The technology inspired the 1954 British film, *The Brain Machine*, in which a psychiatrist using an EEG discovers his patient is a psychopath. Walter even noted a similarity in brain wave patterns of people who form close or intimate attachments. He suggested in an interview with *Life* magazine that young couples be routinely tested with the EEG for compatibility. (However, after swapping wives with a local greengrocer, Walter discovered his new partner had a markedly different alpha rhythm from his own, prompting him to revisit his theory.) Some peers were skeptical of Walter's approach, and one observer noted dryly that "his recent adoption of a singularly Mephistophelean beard may be all too symptomatic of his growing feeling of self-importance in the international electroencephalographic scene."³ Nevertheless, Walter's scientific achievements were real enough. Using the EEG, he found that the alpha rhythm disappears from most of the brain during mental tasks that require purposeful thinking, and is even reduced by the simple act of opening the eyes. He further concluded individual differences in brain wave patterns discerned differences in visual imagination. Walter's experiments with flicker also produced a remarkable additional finding: his subjects compiled an inventory of what he described as "the

greatest variety of mental experiences." In a paper published in 1949 in the scientific journal *Electroencephalography and Clinical Neurophysiology*, Walter presented the first systematic study of flicker, breaking the evoked responses into categories of experience:

1. Visual sensations with characters not present in the stimulus, that is (a) Color; (b) Pattern; (c) Movement.
2. Simple sensations in other than visual mode:
 - (a) Kinesthetic (swaying, spinning, jumping, vertigo); (b) Cutaneous (tingling, pricking); (c) Auditory (rare); (d) Gustatory and olfactory (doubtful); Visceral [probably connected with (a)].
3. General emotional and abstract experiences:
 - (a) Fatigue; (b) Confusion; (c) Fear; (d) Disgust; (e) Anger; (f) Pleasure; (g) Disturbance of time sense.
4. Organized hallucinations of various types.
5. Clinical psychopathic states and epileptic seizures.

That flashing light could instantly alter the ordinary mode of consciousness was a remarkable observation, one equaled by Walter's further observation that it could artificially induce epileptic fits in some normal people. Epilepsy has long inspired divine associations, as its strange symptoms of sensory disturbance, loss of consciousness or convulsions were considered a sacred malady in the ancient world. Epileptics describe experiences of rapture. Fyodor Dostoyevsky wrote: "All of you healthy people have no idea of the happiness that we epileptics experience in the moment before a fit. Mohammed, in the Koran, affirms that he saw Heaven during an epileptic fit (for he, too, was afflicted as I am). I do not know whether this blessed state lasts for seconds, hours or months, but believe me, I wouldn't give it up for anything in the world."⁴ To Walter, the evidence that flicker could bring on an epileptic episode in non-epileptics suggested the condition should not be strictly viewed as a neurological degeneration, but could be a function of the normal physiological order, as he put it: "A vestigial echo of

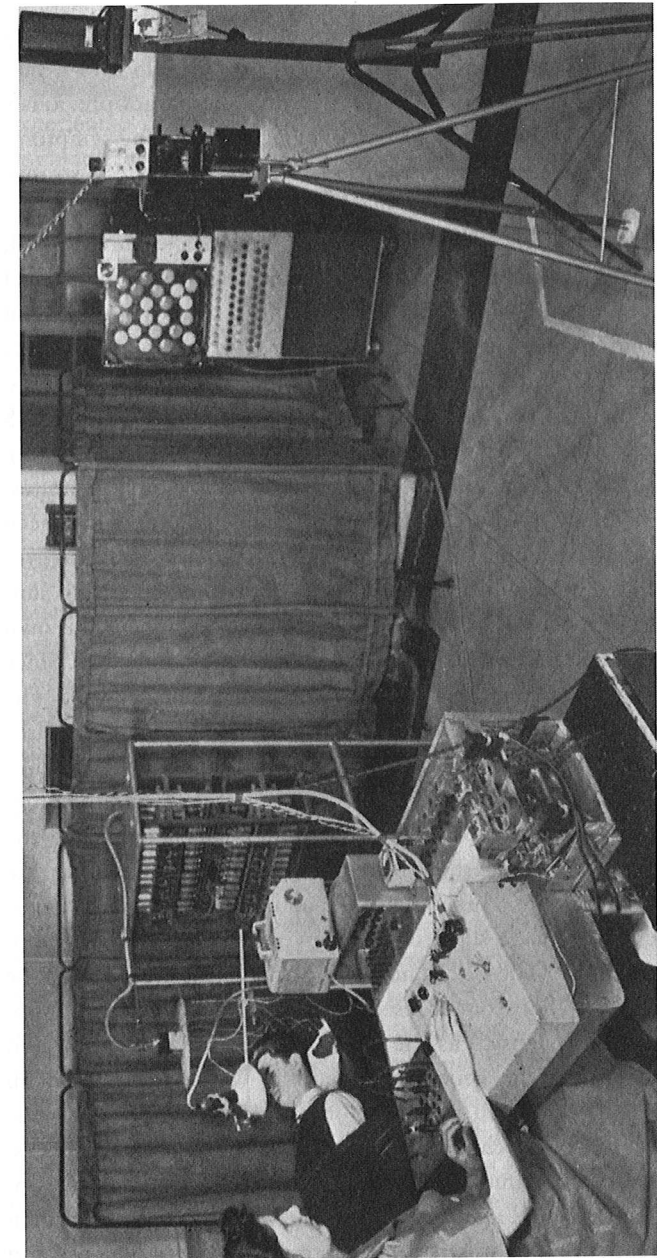


PHOTO COURTESY OF GERALD DUCKWORTH & CO.

The Toposcope Laboratory, Burden Neurological Institute. c. 1951. A subject (left) is shown on a couch with triggered stroboscope (flicker) reflector. W. Grey Walter included this photograph in his classic work *The Living Brain*.

that first remote foreshadow of a brainstorm." His laboratory trials found that bright flickering light produced in 3 or 4 percent of perfectly normal people electrical discharges previously thought to have been diagnostic of epilepsy, including symptoms such as severe transient disturbances of consciousness, strange feelings, faintness, or swimming of the head. In some cases, the subjects experienced a petit mal, or "absence" seizure, a brief, and barely noticeable, loss of consciousness where the subject stopped moving or speaking, stared ahead blankly and did not respond to questions. When the subject returned from this state, usually after thirty seconds but sometimes after several minutes, the individual was unaware that he had been away. In a 1948 letter to Walter, Reginald Bickford, a British researcher working at the Mayo Clinic, described some "very intriguing" manifestations of the phenomenon: "A boy aged eight years had been noticed to develop a habit of waving his hand in front of his eyes whenever he saw a bright light or was exposed to strong sunshine. Well believe it or not he turned out to be inducing his own petit mal attacks by flickering the light falling on his eyes. Since then we have been able to find two more similar cases."⁵ The self-induced cases were explained as examples of children wishing to escape from stress or boredom. In his own clinical trials, Walter also identified more extreme symptoms. A small number of subjects experienced physical jerkings which mimicked the frequency of the flashes. Rarely, an actual grand mal seizure occurred. Aldous Huxley later expanded on Walter's findings, arguing there is "a slight danger" involved in use of the stroboscopic lamp: "The risk is not very great; but it must always be recognized." Subsequent research placed the incidence of "photosensitive epilepsy," as the condition became known, at 1 in 4,000 among the general population. Walter also noted an apparently unrelated phenomenon that is even more rare—the occurrence of psychopathic states, or psychiatric disturbances. These are sometimes of a bizarre nature, and include one subject who suffered an attack of violent weeping, with every sign of great emotional distress, tears streaming down her face and

sobbing loudly, yet she said she felt no sorrow and when comforted would cry out "It's quite alright."

For most of Walter's subjects, however, flicker induced only experiences of transcendent beauty. In 1953 he published his popular account on the electronics of brain action, *The Living Brain*. Walter used a chapter entitled "Revelation by Flicker" to describe the result of experiments with the stroboscope among laboratory staff and subjects at the Burden Neurological Institute. All noticed a "peculiar effect . . . a vivid illusion of moving patterns whenever one closed one's eyes and allowed the flicker to shine through the eyelids." The stimulus source, the stroboscopic light, itself was white, stationary, and featureless, yet Walter's colleagues, and all of the normal subjects who participated in his investigation, reported seeing colored moving patterns. Exposed to flicker at certain intervals, these subjects, hundreds of people in all, demonstrated radical change in their EEG response and reported "dazzling lights of unearthly brilliance and color developing in magnitude and complexity of pattern as long as the stimulation lasted."

The patterns would usually take the form of a "pulsating check or mosaic, often in bright colors. At certain frequencies—around 10 per second—some subjects saw whirling spirals, whirlpools, explosions, Catherine wheels," Walter wrote. Two American researchers, Carl R. Brown and J. W. Gebhard, undertook similar trials with similar results: "A most remarkable display of color and form perceptions." They described kaleidoscopic displays, fluctuating continuously, and at times dominated by patterns such as windmill vanes and checkerboards, and made a distinction between the bright phase and dark phase, distinguishable by differences in the illusory imagery. Brown and Gebhard acknowledged the fundamental mystery of the source of the patterns. They also likened some of their findings to the patterns observed by Purkinje and Helmholtz in their study of pressure images. Walter went a step further, suggesting photic stimulation produced results comparable to hallucinogenic drugs.

In 1954, Aldous Huxley described virtually identical recurrent illusory images observed during mescaline use: "colored, moving, living geometrical forms which undulate into more concrete perceptions of patterned things, such as carpets, carvings, mosaics." In his essay "Mechanisms of Hallucinations," University of Chicago professor Heinrich Klüver analyzed hallucinatory phenomena resulting from mescaline use, which included similar patterns, such as chessboards, cobwebs, and spirals. He also noted a "kaleidoscopic play" of colored, moving patterns. Klüver referred to these common and recurring visions as "form-constants," as they take on specific forms rather than the appearance, as he put it, of "visual dust." In his science fiction novel, *Further Outlook*, published in 1956, Walter alluded to a yearning to derive deeper meaning from the patterns. He paraphrased a line from T. S. Eliot's "The Love Song of J. Alfred Prufrock": "I cannot say exactly what I mean, as if a magic lantern threw the nerves in patterns on a screen." The Magic Lantern utilized a sequence of slides, each producing its own visual effect, but together creating a larger experience, a story. Likewise, Walter believed the stroboscope produced its own story. The vivid patterns of interior geometry prompted the neurologist to write, seemingly autobiographically, of one character having a desire "that the patterns would mean something to others beside himself."

Not only geometric patterns, but a "flight of colors" is evoked by stroboscopic light. A 1954 study identified the frequencies of color produced, finding red the most common, followed by blue and orange/yellow. While vivid, the colors are, however, of an unreal nature. The manner in which they are "artificial" was described by Margiad Evans, a British poet, in her book, *A Ray of Darkness*, which documents her life as an epileptic. Evans was exposed to flicker as part of her clinical assessment during the 1950s, and drew a distinction between the colors she encountered during flicker visions, and "real" colors: "Lights like comets dangled before me, slow at first and then gaining a fury of speed and change, whirling color into

de la couleur

color, angle into angle. They were all pure ultra unearthly colors, mental colors, not deep visual ones. There was no glow in them but only activity and revolution." Later research emphasized that the colors produced by flicker are "unnatural," and that some subjects found that the "images were colored more vividly than things seen in ordinary life."⁶ It was unusual for the colors to be described as those of the real world. Huxley, who considered light as the first, and most important, visionary experience, wrote: "Everything is brilliantly illuminated, shining from within, and a riot of colors is intensified to a pitch unknown in a normal state." He later observed that colors could be altered by the speed of the flashes. Huxley noted that when the flash interval was between ten to fifteen times a second, the patterns were prevailingly orange and red. At more than fifteen flashes, green and blue patterns appear. Walter expanded on Evans' reference to "mental colors" in an article published in the scientific journal *Nature*, arguing that most of his subjects had no difficulty recognizing the "illusory character of the colors." They were not actual colors, but they were "real" enough as to be identifiable, and their intensity made them even more splendid.

In his research involving epileptic and brain-injured subjects, Walter had previously recorded illusory effects far beyond those of color and geometric pattern: bizarre hallucinations involving more than one sense, even complete scenes. In one case, a brain-injured patient had recurrent visions of "an ugly old crone dressed in rags and emitting a disagreeable smell, who would clatter about in the kitchen, apparently cooking some unsavory dish." Wilder Penfield, of the Montreal Neurological Institute, had found that organized hallucinations could be induced by stimulating the brain with a very fine electrode. Penfield was able to provoke what one of his patients called "dreamy states"—strips of memory, visual scenes, emotional involvement, and auditory hallucinations so crisp that the patient, under a local anaesthetic, was convinced there was a radio or record player in the operating room. Walter, however, found that complex, dynamic hallucinations, like those experi-

enced by brain-injured subjects and by Penfield's patients, could be evoked by flicker in perfectly healthy people. Not only colors and patterns were described by Walter's subjects, but bare emotions, feelings of vertigo, simple sensations like tingling of the skin and lightness of being, and significantly, "organized hallucinations, that is, complete scenes, as in dreams, involving more than one sense." Walter was struck by the discovery that the flicker-induced hallucinatory experiences of his normal subjects seemed as broad and dynamic as anything experienced in the medical case histories, and even included the apparition of recognizable faces and figures. In one instance, an entirely normal and technically sophisticated individual reported seeing "a procession of little men with their hats pulled down over their eyes moving diagonally across the field." For some of the experiments, two light sources were used simultaneously with flashes occurring at independent frequencies. The result was visions of remarkable complexity: "The hallucinations described by some subjects were of a character so compelling that one subject was able to sketch them some weeks later." Wrote Walter: "In highly organized hallucinations, small animals, particularly reptiles, loosely draped human figures, miniature brightly colored objects such as omnibuses and Chinese lanterns, and reduplicated figures, processions, often moving obliquely across the field of view or climbing as on Jacob's ladder" are prominent. In some subjects, a specific frequency of flicker was found that could evoke "overpoweringly vivid memories of past experiences." Walter even found time itself could become "lost or disturbed." As one subject put it, he had the sense of having been "pushed sideways in time" by the flicker. Yesterday was no longer behind, and tomorrow was no longer ahead. Walter described the sensation in *Further Outlook*, which concerns itself in part with time travel: "Cut out the Past—the Past—no more exists than the Future . . . tell your generation . . . no fooling with Past and Future trespassing."

The findings that flicker could induce "gross distortions in sensorium" were supported by other researchers. Richard H. Blum,

of the Stanford Research Institute, reported that stroboscopic light had "opened new frontiers of inquiry into the borderlands of neurology and psychology." He used flicker on three groups of subjects, normal people, patients with organic brain damage, and schizophrenics, and reported that the greatest response was among the "normals." These subjects reported a wide variety of moving colors, patterns, and "feeling states"—such as feeling relaxed, pleasant, or experiencing temporal changes and the sensation of floating. They also described "meaningful images," including fire, flashlights, waves, the ocean, the sky, woods, a crab, an umbrella, a subway tunnel, eyes and the cross. In a 1953 study, A. M. Costa described three types of pattern obtained from sitting with eyes shut before a flashing light. The first, which he termed "autosopic," he attributed to physiological causes such as retinal veins. The second, geometrical patterns, included kaleidoscopic effects, ornamental designs, roman roses, and gothic designs. The third, hallucinatory, included horses, sails, and eyes. These were clearly cortical in origin. In South Africa, researcher A. C. Mundy-Castle tested responses to photic stimulation, noting color and patterns, but further reporting the "fairly frequent" occurrence of sensations such as swaying, swinging, spinning and rolling, as well as emotional responses and "disturbed time sense." He also described a case where hallucinations evoked by the stroboscope included "visual reconstructions of past events."

Walter suggested that the apparitions were caused not by properties of the light itself, or by the eye, but were a product of the brain. He attributed their movement to "some hitherto unsuspected mechanism." In order to explain this unknown factor, he produced an equation: Flicker plus x produces Movement ($F + x = M$). He theorized that x was a scanning mechanism, the most familiar example of which is television. Walter further surmised that the activity of the alpha rhythm, as a scanning mechanism, is central to the understanding and transference of information from the visual projection areas of the brain to the association areas, or as he described it in the

Scanning mechanism
TV

journal *Discovery* in 1952, in "transforming the pattern of things seen in space into a sequence of signals in time." Flashes of bright light at intervals of ten per second produce movement and patterns, "rotating and pulsating in a quite dizzy fashion." The sense of movement is due to "rhythmic waves of activity" spreading out from the brain's projection areas. The illusory patterns are made more vivid when the eyes are shut because no real patterns interfere with what is registered by the EEG as the alpha rhythms. Wrote Walter:

This curious effect can be accounted for if we regard the flicker as interfering with the normal process of scanning. A similar effect can be produced on a television screen by illuminating the television studio with a flickering light. The resulting interference with the picture would be very hard to bear. The effect of flicker is sometimes just as confusing to the brain; the conflict between the two different time patterns—the inherent scanning rhythms of the brain, and the flicker—can produce a brainstorm as wild as any distortion on the television screen.

In short, the patterns were interference produced by a scanning mechanism attempting to deal with an intermittent signal.

Walter's findings might have been only a scientific curiosity, except he recognized that the necessary conditions for the flicker phenomenon can also occur randomly in everyday life. After his research was first published, Walter began to receive unsolicited accounts from people who had comparable experiences, such as flicker responses caused by a film projector. Even cycling down an avenue of trees could evoke a response. In the case of one man, the flicker caused him to "pass out" for an instant. The loss of the control induced by the flicker stopped his pedaling: "He had suddenly realized that his cycle had come to rest but he had not fallen off and he was gripping the handle bars fiercely." When the bike stopped, so did the flicker frequency, thereby ending the episode. Another correspondent wrote of encountering flicker as sunlight played on his face while riding in the passenger

seat of an army jeep as it traveled past trees. It was the neurologist Sir Russell Brain who said in *The Nature of Experience*: "Lest it be thought that [the] results of the administration of drugs are quite remote from the experiences of normal people, let me quote Grey Walter's observations on the effect of exposing normal individuals to a flickering light."

• • •

John R. Smythies was the first to report that stroboscopic light not only stimulated illusory experience, but enhanced the effect of mind-altering drugs. Smythies was at the forefront of a new era of psychological investigation using hallucinogens. His interest in psychedelic drugs was stimulated by reading A. Rouhier's 1927 monograph, *Le Peyotl*, with its account of "an experience of unimaginable art, unforgettable." In "The Mescaline Phenomena," an influential treatise published in 1953 in the *British Journal for the Philosophy of Science*, Smythies described his own experiences with the drug, as well as those of other researchers, drawing attention to the remarkable nature of the hallucinations and suggesting the resulting phenomena "worthy of the most careful consideration by philosophers." Smythies was singularly well suited to make such an observation. The young English scientist attained the equivalent of both an M.D., and a Ph.D. (in neuroanatomy) from Cambridge University, and studied philosophy and anthropology at the University of British Columbia. Unusual for a scientist, his poetry has been published in the *Poetry Review*.

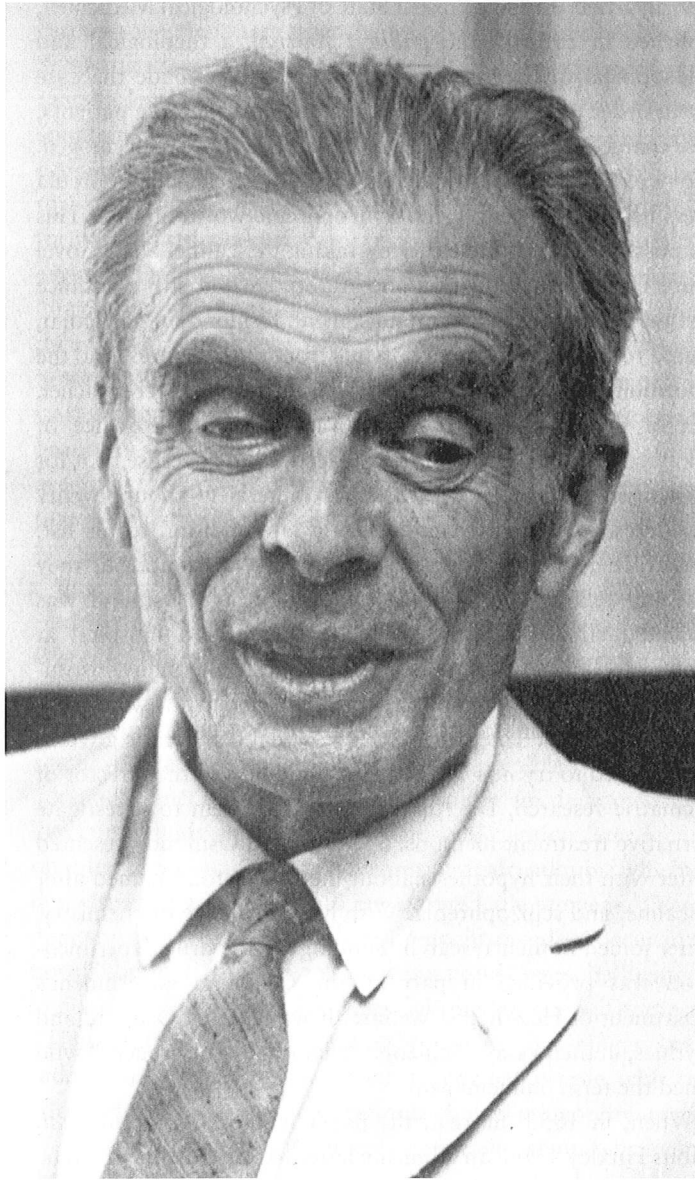
Smythies advanced several intriguing theories arising from his mescaline research. He questioned the assumption that physical objects are real and that hallucinations are not, observing that no hard-and-fast line can be drawn between them. Hallucinations can be virtually indistinguishable from "real" sense-experience, sharing many of the same characteristics. They occupy time and space, exist in color, and occur in the visual field. Appropriately, those who encounter them describe

them with terms like "I see" and not "I seem to see." Smythies further suggested that rather than the hallucinations being simply "constructions of a disordered brain", they may instead represent "a level of reality that is normally hidden from us"—the spontaneous activity of the mind freed by the drug from brain processes which normally inhibit such activity. The result being that "the human psyche becomes released, or revealed, in the form of the stupendous panorama of the mescaline images." He argued that this autonomous activity of the mind consists of "incomparably the most magnificent and beautiful events within the range of human experience." Smythies described it as a manifestation of the "collective unconscious," a view supported by Carl Gustav Jung in a letter to Smythies.⁷ Explaining the extreme beauty of the mescaline images, Jung said they were "psychical events in their pure state, sensations in their natural form" and that "normal experience is constructed out of this raw material by the action of the physical world, and thus the phenomena of ordinary everyday experience are less beautiful."

Smythies, along with a colleague, the psychiatrist Humphry Osmond, also developed the first specific hypothesis of the biochemical basis of schizophrenia. While on staff at St. George's Hospital, London, Smythies observed that mescaline is a close chemical relative of adrenaline and it is possible that a fault in adrenaline metabolism in the brain might produce mescaline-like compounds and hence a psychosis. Attention later focused on other compounds, adrenochrome and adrenolutin, which are derivatives of adrenaline and are known hallucinogens. There is now considerable evidence that adrenochrome does occur in the normal brain. It is also mentioned as a potent street hallucinogen in *Fear and Loathing in Las Vegas*. Wrote Hunter S. Thompson: "That stuff makes pure mescaline seem like ginger beer." Indeed, the psychological effects in normal people who take adrenochrome more closely resemble clinical schizophrenia than they do the effects of mescaline. For example, symptoms include thought disorder and body image disturbances, but not vivid visual hallucinations.⁸

In an article on "The Present State of Psychological Medicine", published in 1953 in the *Hibbert Journal*, a theological and philosophical quarterly, Osmond and Smythies made the case that in order to establish a rapport with schizophrenic patients, those charged with their care needed to experience an hallucinogen. They wrote: "No one is really competent to treat schizophrenia unless he has experienced the schizophrenic world himself. This it is possible to do quite easily by taking mescaline." The novel nature of their investigations invariably elicited stiff resistance from the British psychiatric establishment. Osmond, in particular, wanted to get as far away as possible from the strictures, and the opportunity presented itself in the form of Dr. D. G. McKerracher, chief of the Psychiatric Services Branch for the Province of Saskatchewan. McKerracher had placed a job advertisement for psychiatrists, and traveled to Britain to interview about seventy candidates. Humphry Osmond was a late addition to his list. McKerracher had set aside ten minutes for Osmond, but they were still talking four hours later. As a result, Osmond was appointed clinical director of the Saskatchewan Hospital at Weyburn. He was soon joined by Smythies. Like many institutions at the time, Saskatchewan's psychiatric hospitals were grim, medieval lockups. The province's new social democratic government wanted to try new approaches, and allowed the director of psychiatric research, Dr. Abram Hoffer, free rein to investigate alternative treatment methods. Smythies and Osmond presented Hoffer with their hypothesis about the "M factor," named after mescaline, and schizophrenia. With his knowledge of chemistry, Hoffer joined in their research. Funding for the drug experimentation was provided in part by the Canadian government's Department of Health and Welfare. It was Hoffer, Osmond and Smythies, in their essay "Schizophrenia: A New Approach," who coined the term hallucinogen.

When, in 1953, he read the paper in the *Hibbert Journal*, Aldous Huxley wrote an admiring letter to Smythies in which he expressed his longstanding interest in mescaline, and indicated a desire to "get hold of a supplier of purified mescaline." He



The author Aldous Huxley, whose book *Heaven and Hell* described flicker as “an aid to visionary experience,” in Copenhagen on 15 August 1961.

PHOTO COURTESY OF TOPHAM PICTUREPOINT COPYRIGHT 1999

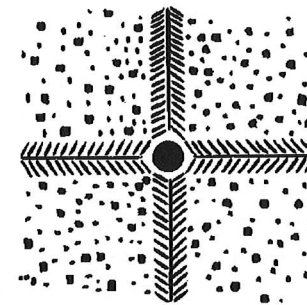
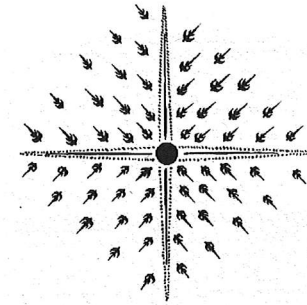
appended an assurance that he had no intention of misusing the information “to become a dope addict or induce others into the wrong path!” A short time later Osmond traveled from Saskatchewan to Los Angeles for a conference of the American Psychiatric Association. He accepted an invitation to stay with Aldous and Maria Huxley. It was Osmond who gave Huxley four-tenths of a gram of mescaline. He watched as the drug worked on Huxley, and “slowly etched away the patina of conceptual thinking.” Huxley took mescaline in search of illumination, and wrote *The Doors of Perception* in 1954, and its 1956 sequel *Heaven and Hell*, based on the experience, inducing many others to follow his path and thereby helping incite the psychedelic revolution of the Sixties. He later also took LSD and psilocybin.

Huxley, born in England in 1894, was educated at Eton but left early owing to an eye affliction which left him practically blind for several years and with poor eyesight the remainder of his life. He said it prevented him from leading the kind of life preordained for a public school-trained English gentleman: “Providence is sometimes kind even when it seems harsh.” He produced many novels, the most famous of which was his cautionary tale, *Brave New World*. Eventually moving to California, his later writings are of a mystical character. He elicited outrage by suggesting that mescaline and LSD were “drugs of unique distinction” which enabled him to discover a “sacramental vision of reality.” Of the experience, Huxley wrote: “Words like Grace and Transfiguration came to mind.” In *The Doors of Perception*, he referred to the research by Hoffer, Osmond and Smythies into schizophrenia, and marveled at the possibility that “each one of us may be capable of manufacturing a chemical, minute doses of which are known to cause profound changes in consciousness.” Huxley ascribed to the view of the Cambridge philosopher C. D. Broad that the “function of the brain and nervous system and sense organs is in the main *eliminative* and not productive. Each person is at each moment capable of remembering all that has ever happened to him and of perceiving

everything that is happening everywhere in the universe. The function of the brain and nervous system is to protect us from being overwhelmed and confused by this mass of largely useless and irrelevant knowledge" leaving only a "small and special selection which is likely to be practically useful." Applying the theory, Huxley concluded that each one of us is potentially "Mind at Large." As evidence, he pointed to Smythies' observation that what is encountered under mescaline, or LSD, are not remembered scenes, or people, or things, but the raw material of creation. In *Heaven and Hell*, Huxley quoted Smythies' description of the experiences as "the work of a highly differentiated mental compartment, without any apparent connection, emotional or volitional, with the aims, interests, or feelings of the person concerned." Smythies, however, had also cautioned that if we were all to live in a mescalinated world, life would be more fascinating, beautiful, or terrifying, "but the business of the world would soon come to an end."

After moving to the University of British Columbia in 1954 to continue his research into the far reaches of consciousness, John Smythies produced the first study to describe the effects evoked when volunteers were exposed to a drug in conjunction with stroboscopic light. The study, "A New Hallucinogen," was conducted at the university's Department of Neurological Research. A series of subjects reported that flicker transformed the effects of Trimethoxyamphetamine, or TMA, a hallucinogen first synthesized in 1947 by Imperial Chemicals Ltd. of Manchester, England. At low doses, TMA alone evoked some of the usual features of a drunken state, including giddiness and a loss of inhibitions, but no hallucinations. With stimulation by the stroboscope, however, the subjects immediately entered a hallucinatory state. What is more, once they had been exposed to the stroboscope, some were able to experience visual hallucinations without further flicker stimulation.

One subject, a twenty-two-year-old male, was administered TMA, and displayed evidence of inebriation. However, upon



The hallucinogen TMA was administered to subjects at the Department of Neurological Research at the University of British Columbia in 1954. When exposed to bursts of stroboscopic light, patterns were evoked, with flashes of brilliant blue like a welding arc (top), black chevrons (middle), and blue snow flakes (bottom). These were later published in the *Journal of Mental Science*.

introduction of the stroboscope two hours later, he described mosaics similar to those he had seen "in the movie version of Turkish Temples." Neon signs raced up and down his field of vision as on a theatre marquee. Green snow fell, as did gold and silver rain. He saw fireworks. Queen Elizabeth the Queen Mother appeared to him bathed in royal purple. The young man described encountering colors he had never before seen—entirely new colors. He found himself in the midst of a scene with large, cat-like creatures with enormous green fangs, but said he was not threatened by them. A second subject, a twenty-two-year-old female, experienced structured hallucinations when the stroboscope began to flash one hour and a half after taking the TMA. With eyes closed, she immediately saw a woman walking down New York's Fifth Avenue with a poodle. An examiner asked if the scene was in three dimensions, and the subject replied, "In fact it's in six dimensions." Indescribable objects were spinning in various parts of her visual field, rotating through different planes. At one point she said: "If you were a modern artist you could have a wild time painting the things that I am seeing." The flicker was turned off, and the hallucinations stopped. When the photic stimulator was turned back on, she described complex scenes, in the form of a pie cut into six pieces. Each piece contained a different scene, and when she chose, she could "go into one of these scenes and become part of it so that you are sitting in the middle of what is going on." In one case, the flicker elicited the image of "an oriental bridge across a stream in an oriental garden." A third subject, a twenty-three-year-old medical student, initially saw only a series of color patterns of a geometric nature while under the influence of TMA. In response to the stroboscope, however, the complexity of the patterns was enhanced, and then it produced scenes. He kept talking about a "beautiful three dimensional effect." He felt as if he were looking down a tunnel of greatly exaggerated perspective, where he saw men standing on a spiral staircase. He thought they might be "midshipmen preparing for their graduation at Annapolis, or a choir of men."

Smythies subsequently applied his investigations with flicker to other drugs, concluding that "the stroboscopic lamp, the intimate flood, potentiates the effects of LSD." He found a similar effect on mescaline, noting "hallucinations of the mescaline type may be induced by its use with a dose of mescaline that would not ordinarily induce hallucinations." In addition, he found that in cases where a subject was given a full dose of mescaline, and was fully involved in the resulting hallucinations, the stroboscope could still alter the nature of the hallucinations: "If one flash of the stroboscopic lamp is directed at my closed eyes, I will notice that the complex hallucinated pattern will immediately change." This observation has led to intriguing speculation that it may account for "the uses of lamps and shiny objects in theurgic rituals"—a system of ancient pagan belief.¹⁰

Humphry Osmond felt Smythies' use of the stroboscope to temporarily enhance the effects of a hallucinogen at low dose offered "a valuable clue." He and Hoffer subsequently utilized the stroboscope to further their ongoing investigations of adrenaline derivatives, testing the theory that an hallucinogen, present in the human body, affected the psychiatric state of individuals. They found that when subjects were exposed to the stroboscope, they saw vivid colors and geometric patterns both with adrenolutin, and with a placebo. However, the combination of flicker and adrenolutin produced enhanced colors and more abstract, disorganized patterns. Complex hallucinations were also evoked: "In a couple of instances, clear-cut images were seen. For example, one subject saw pairs of eyes of different sizes but perfectly matched with eyelids but without eyebrow and face, moving across the field in a clockwise direction. The eyes were very bright, pleasant and very real." Another described seeing redwood trees along the U.S. Pacific coast, with sunlight playing upon them. Not all the hallucinations were beautiful, as one subject described experiencing "a nightmare in technicolor."¹¹

Perhaps because of his own flawed eyesight, Huxley was intrigued to learn that the stroboscope tended to "enrich and

intensify" visions induced by psychedelic drugs. It was Huxley's account of stroboscopic light in *Heaven and Hell* which introduced flicker as "an aid to visionary experience" to a burgeoning new audience concerned with the expansion of consciousness. With his further account of Smythies' discovery that it improved upon the effects of hallucinogens, Huxley guaranteed stroboscopic light a place in popular culture. The phenomenon was confirmed by independent research in 1955. Louis Cholden, a researcher at the National Institute of Mental Health and editor of *Lysergic Acid Diethylamide and Mescaline in Experimental Psychiatry*, was experimenting with LSD as part of an investigation into its clinical applications. The colored abstract geometry Cholden was seeing under the influence of LSD was transformed, when he sat under a stroboscopic light, "into ineffably beautiful Japanese landscapes." These landscapes were unlike anything the researcher had previously encountered. Stanislav Grof, who later became chief of psychiatric research at the Maryland Psychiatric Research Center, and authored books such as *Beyond the Brain*, participated in similar early experiments with LSD in which researchers tried "driving the brain" with stroboscopic light. In one LSD experiment, Grof noted a dramatic change when the flashing light was introduced, and described being "catapulted" out of his body by the flicker: "I had the sense that I was a disembodied consciousness of cosmic universal dimensions."¹²

In *Heaven and Hell*, Huxley discussed the effect of the stroboscope: "To sit, with eyes closed, in front of a stroboscopic lamp is a very curious and fascinating experience. No sooner is the lamp turned on than the most brilliantly colored patterns make themselves visible. These patterns are not static, but change incessantly." Huxley noted that the cause of the colored patterns and the process by which they were translated by the visual center and optic nerves and registered in the mind had not been proven. However, he believed the experience evoked by the stroboscope was linked to the interference of the rhythm of the lamp

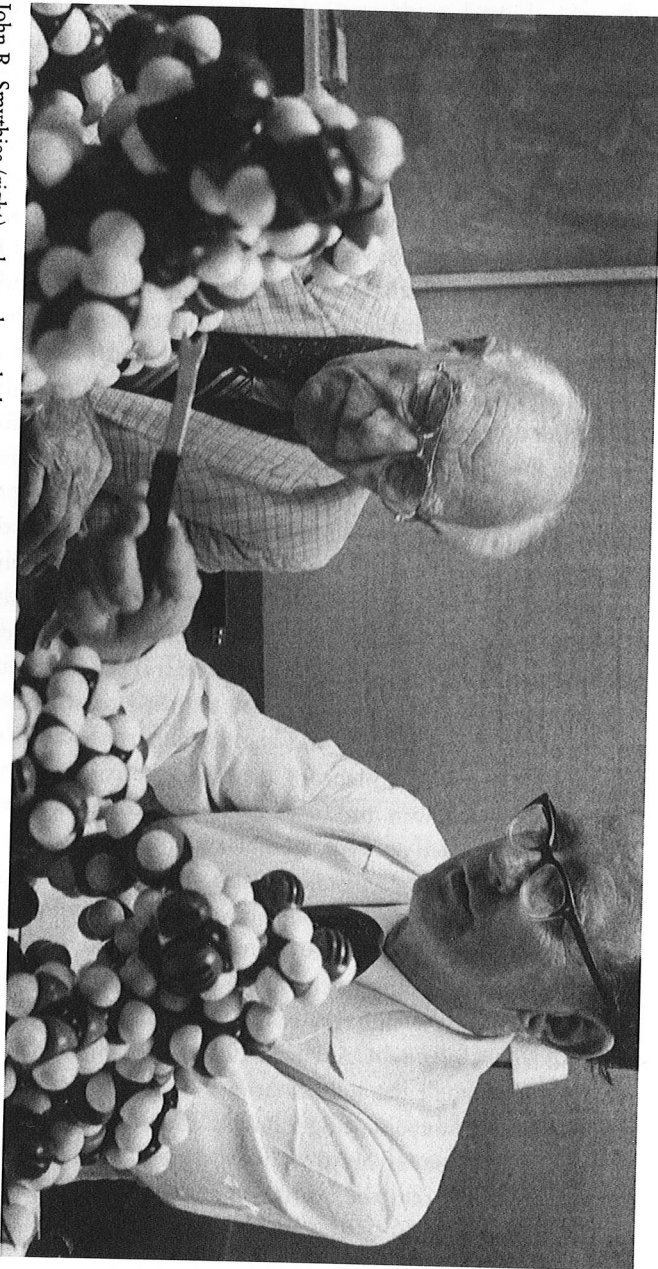


PHOTO COURTESY OF J. R. SMYTHIES

John R. Smythies (right), who undertook the most thorough investigation of the stroboscopic patterns, shown c. 1971 in his neurochemical laboratory with former teacher, Nobel laureate Sir John Eccles, surrounded by interesting molecular models.

with the electrical rhythm of the brain. In reference to Cholden's experience, he asked: "How on earth can the interference of two rhythms produce an arrangement of electrical impulses interpretable as a living, self-modulating Japanese landscape unlike anything the subject has ever seen, suffused with preternatural light and color, and charged with preternatural significance?" Huxley exchanged views on the subject of visions induced by the stroboscope with Humphry Osmond, and remained intrigued that flashing light enriched and intensified visions induced by certain drugs, aiding their entry into our consciousness.

Grey Walter expanded on the potential for visionary experience to be achieved when one hallucinogenic mechanism is combined with another. Evocatively, Walter argued that exposure to flicker when tired, in solitude, or when fasting, could provide a similar combined trigger: "We need only consider the traditional conditions specified for the promotion of mystical experiences to draw up a catalogue of hallucinogenic physiological stresses." Nor were drugs like mescaline the only mechanism linked to experience evoked by stroboscopic light. A 1954 study was the first to report that sensory deprivation produced "visual phenomena . . . quite similar to what have been described for mescal intoxication, and to what Grey Walter has . . . produced by exposure to flickering light." In the case of sensory deprivation, a few hours of social isolation combined with reduction of sensory stimulation to the lowest levels would, Walter argued, "produce in most normal subjects a state of mental confusion which often progresses to organized hallucinations such as processions of animals and convictions of inner truth." At a 1958 symposium on sensory deprivation held at Harvard Medical School, researcher Woodburn Heron likened Walter's observations of hallucinations caused by flicker to those produced under sensory deprivation experiments at McGill University in Montreal, where twenty-five of twenty-nine subjects reported experiencing hallucinations while in a sensory deprivation cubicle. One described landscapes divided into strips that were moving in opposite directions, while another could see only eyeglasses. In some cases, the illusions

seemed entirely real—one man moved his head to avoid objects coming at him, and another believed somebody or something was in the deprivation cubicle with him. The experiences were vivid enough to prevent sleep, and their persistence forced one man to abandon the experiment altogether.

In Los Angeles in the spring of 1954, Huxley told the philosopher C. D. Broad of John Smythies' investigations of hallucinatory experience. After Smythies moved from the University of British Columbia to the Psychological Laboratory, Cambridge, Broad wrote to express interest in being "shown the stroboscopic phenomena," and in taking mescaline. While offering the view that "Huxley's book on mescal was somewhat irresponsible," Broad added: "If it were possible for you to administer it to me, at sometime convenient to both of us, I would be greatly interested."¹³ Smythies consented, but Broad's experiences on mescaline were very dull, with the only interesting hallucination involving "devils cavorting about in Trinity Great Court." Broad was not alone. Smythies also administered mescaline to the Oxford logician H. H. Price, and to R. C. Zaehner, professor of comparative religion at Oxford. Zaehner wrote an account of his experiences. In one hallucination he saw the Magus biting at the feet of the infant Jesus in a reproduction of Gentile da Fabriano's Adoration of the Magi. He also witnessed the right ear of a colleague grow to elephantine dimensions. Zaehner had hoped mescaline would produce a mystical experience, but instead found the result "anti-religious" as he began giggling like a teenage girl: "I was plunged into a universe of farce." He based his counterblast to Huxley, *Mysticism, Sacred and Profane*, in part on the experiment. Referring to the use of mescaline to produce artificially a state akin to schizophrenia, Zaehner argued that if it is Huxley's thesis that all mysticism is essentially one and the same, "it must then follow that the vision of God of the mystical saint is 'one and the same' as the hallucination of the lunatic." This Zaehner found contemptible.

Smythies and Osmond came to Huxley's defense, arguing that, indeed, "some mystical saints and some lunatics are under-

going essentially the same class of experience,” and adding that there is no reason why some mystical experiences should not represent contact with God, “and other such experiences be a contact with autonomous levels of the human mind.” Huxley was unmoved by the criticism and by the cultural prejudice against drugs and other methods, such as the stroboscope, of accessing visionary experience. In his final novel, *Island*, published in 1962, the year before his death, he speculated about ways that hallucinatory drugs could be used as a teaching aid for adolescents and as a tool to remind adults of what really mattered. He also speculated on the source of visionary experience: “Angels and New Jerusalems and Madonnas and Future Buddhas—they’re all related to some kind of unusual stimulation of the brain areas of primary projection—the visual cortex, for example.”

• • •

While at the Psychological Laboratory, Cambridge, John Smythies undertook the most exhaustive study ever conducted of the stroboscopic patterns and imagery, reporting the results over three installments in the *British Journal of Psychology*. Following his discovery that the stroboscope enhanced the effects of hallucinogens, Smythies sought out a meeting with Grey Walter. The two researchers met at Walter’s laboratory at the Burden Neurological Institute, and discussed theories about the cause of the flicker experience. Smythies was fascinated by the patterns, which he felt allowed direct insight into processes in which the brain failed to handle an input properly. He employed regular rhythmic flashes, but also experimented with random flicker achieved by driving the flashes with a Geiger counter responding randomly to a radioactive source, although he found the patterns obtained were similar. Beginning in 1955, Smythies tested approximately 1,000 subjects, and included himself in that number. He noted that there were wide differences between individuals in the nature of the patterns reported, but that the

range and type of patterns encountered by an individual was constant, and, much like fingerprints, appeared unique to that person. He also concluded that whether a photic stimulator, a rotating sector disc in a beam of light, a sine wave, or a large fan rotated at the proper speed and viewed against the sky, all produced patterns: “This indicates that the particular form of stimulus is not important, so long as there is vigorous temporal alternation of light and dark.”

Smythies studied both the “bright” and “dark” phases of flicker. The bright phase is achieved when both closed eyes are being stimulated by the flashes, and in half the subjects when only one eye is being stimulated. The dark phase is only encountered when one eye is being stimulated and occurs in the remaining 50 percent of subjects. Smythies found patterns could be obtained with either one or both eyes subject to a stroboscope, although the geometric patterns were largely associated with the bright phase and included stars, a variety of crosses including the Maltese cross, Catherine wheels, mandalas, mosaics, snowflakes, crystals, honeycomb, herringbone, fingerprint patterns, magnetic fields, labyrinth patterns, and grids (in one case a “family of parabolas” superimposed on a grid).

In the dark phase, the remaining 50 percent see a different set of images and, he noted that “in some people this goes right on to the panorama of objects.” He classified the content of these illusory images into seven categories:

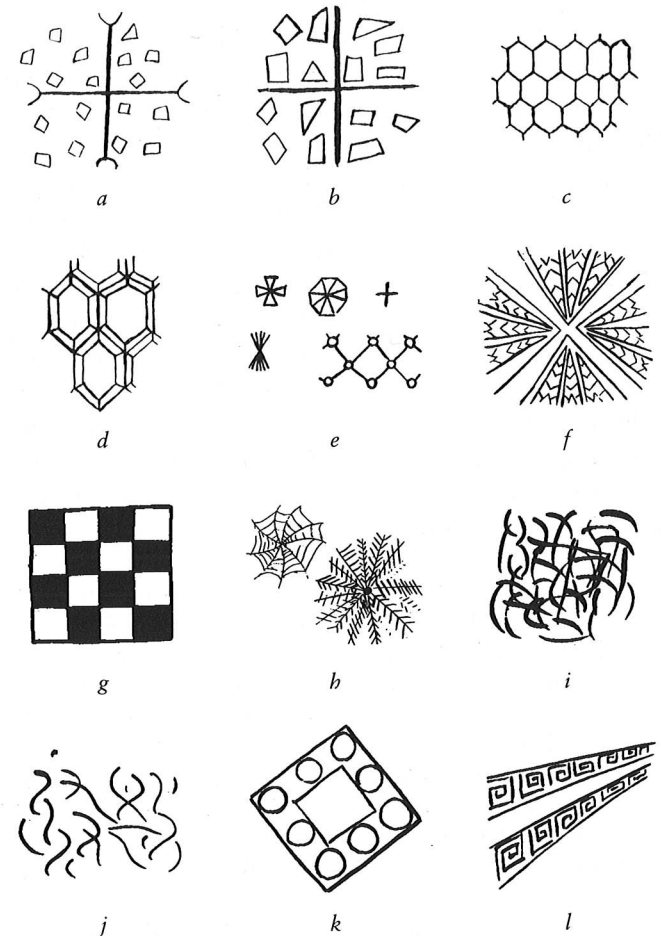
1. Amorphous—Featured two colors, usually red and green, which swirled around with a motion like oil on the surface of water. Said one subject: “A very definite movement, oily, steady and very slow with several swirls, currents, whirlpools, spirals—like liquid stirred up . . . a large number of vortices, both clockwise and anti-clockwise . . . It is a very odd effect indeed, very clear and marvelously pretty.” Another described: “Hot molten earth heaving through the flicker—a volcano—lava in reddish brown.”
2. Particulate—The same swirling motion but with small

objects swirling instead of mere sheets of color. Subjects described it as bacteria under a microscope, pond life, a shoal of fish, "like watching the organization of crystals," or "like looking at London from a tremendous height and seeing . . . streets and blocks of houses, but all swirling about."

3. Stationary patterns—Including paisley, marble, ink-blots, maps, and leaves.
4. Watery patterns—The appearance of clear water that would swirl or ripple over a surface."This effect was extraordinarily vivid," wrote Smythies.
5. Design patterns—Ornamental design invariably described as Victorian wallpaper.
6. Animate patterns—An effect of the presence of "some living thing coupled with a strong emotive sense of 'eerie-ness.'" One subject described "a salmon-pink ground bearing repeated identical irregular snowflakes. These then all melted into the impression of a THING! . . . which became alive; it turned into a living creature—slightly eerie—like Quatermass."¹⁴
7. Scenes—Fully formed scenes, with some subjects seeing a single scene, and others watching a succession of scenes. Landscapes such as grasslands or forests, or some people also view "commonplace objects and events such as trains, cars, street scenes, harbours, animals, people, etc." One subject described them as resembling "a number of scenes in a badly cut film."

Smythies noted that subjects described the imagery as "very interesting, even fascinating" and one even expressed the view that it "possessed a power of addiction over the subject as one developed an active desire to go on looking at them."

On July 14, 1956, C. D. Broad, the eminent, dour, emeritus Knightbridge Professor of Moral Philosophy at Cambridge became the most unlikely subject in John Smythies' flicker experiments, undergoing the first of four sessions under the stroboscope. Broad's wide-ranging philosophical writings were notable for their laborious recitations of theoretical possibilities before he would construct in enormous detail a possible solution.



During his research at the Psychological Laboratory, Cambridge, John R. Smythies compiled an inventory of stroboscopic patterns from drawings provided by subjects, later published in the *British Journal of Psychology*. Figs. a, b and c, d illustrate the effect of suddenly doubling the flash frequency. Fig. e shows "iron crosses," "snow flake," and "teazle-head" patterns. Fig. f Mandala figure. Fig. g Checkerboard. Fig. h Cobweb and snowflake. Figs. i, j Spaghetti after-images. Fig. k Complex figure. Fig. l 'Faults' with Grecian scrolls.

A peer once raised the possibility that Broad might have a sense of humour, leading an editorial writer in the journal *Philosophy* to wonder at "the implausibility of the accusation." Applying Broadian methodology to the problem, the editorial concluded that he did indeed have a sense of humour, although the evidence offered up was slim. Broad was, however, a giant in the theory of knowledge, and the *Times* [London] credited him with working out "perhaps the fullest, clearest and most coherent philosophical theory of perception." The results of Broad's first session under the stroboscope included descriptions of "a bright cross with a circular center," a "crystalline mesh," "a family of yellow parabolas," and three dimensional discs that resembled "a series of flying plates." The second session produced grids, cell-like structures, spirals, and other patterns and designs in wondrous color. Then, in the middle of the third experiment, on July 27, Broad experienced dramatic dark phase imagery:

A perfectly stationary pattern—the ground disappeared and I peered through this at dark green leaves and flowers on a perfectly stationary white wall with no flicker at all—this was then covered up in flickering patterns which slid in from the sides as a series of vertical and horizontal bars in a brilliant yellow orange which gradually increased in thickness to block out the pattern behind. This was a very extraordinary effect. I did this by looking through the flicker . . . It was a clear-cut pattern of small purple flowers and green foliage—involved, sharp and extremely detailed.¹⁵

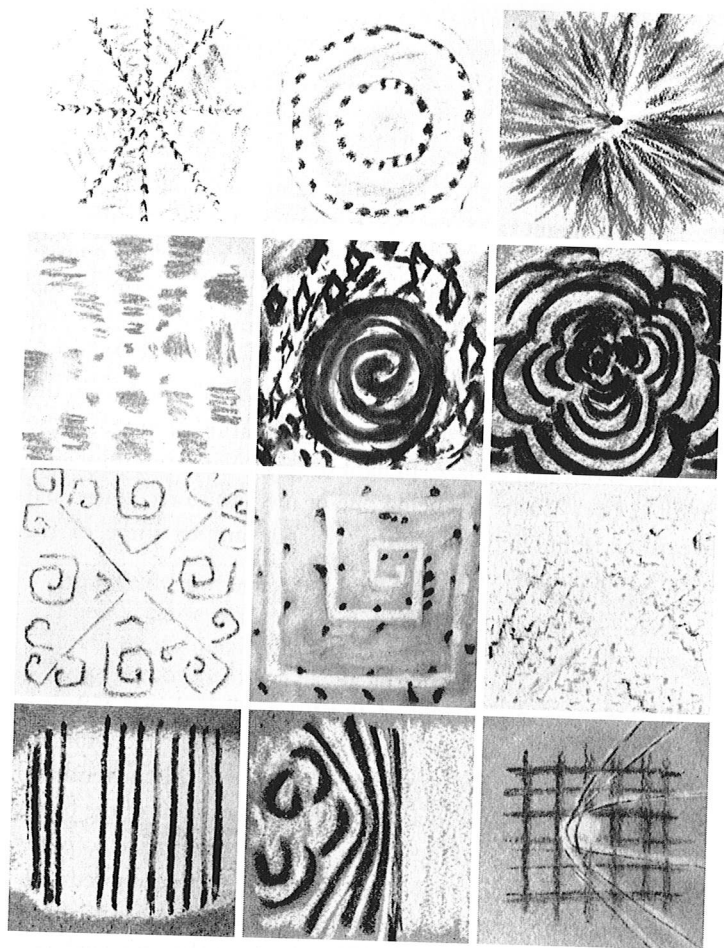
The fourth experiment produced resplendent geometric imagery, and even optical representations of acoustic vibrations: "Lissajou figures of blue, white, and yellow on a light green ground."

Smythies investigated a number of theories to explain the phenomenon of stroboscopic patterns. One explanation was that the flashing light offered no clue to guide the visual system in the process of pattern recognition, so the visual system generated its own hypothesis which took the form of the illusory image or pattern. Another theory attributed the phenomenon to excita-

tion of retinal and cortical neurons, creating complex domains of patterned activity. Smythies suggested the dark phase patterns might be generated in the neurons associated with the closed, unstimulated eye, excited by the activated neurons of the open eye. A third theory conceived of an unknown feature of the visual system that was recessive during normal conditions, but became dominant and perceived during flicker stimulation. Finally, there was the theory of Grey Walter, which was consistent with Smythies' observation that the general form of the patterns most commonly described fell into four groups, and that each group is similar to a scanning mechanism. You can scan with parallel lines, with a radial scan where you start in the middle and spiral outward, with a star radiating outward, or by moving as through a maze. In light of this theory, Smythies later credited Grey Walter for being one of the first to recognize that television technology may prove as relevant to some of the brain's functions as computer technology.

• • •

William S. Burroughs' *Naked Lunch*, published in 1959, is a narrative of hallucination. Burroughs' biographer, Ted Morgan, described it as "bearing as much resemblance to the conventional novel [as] a strobe light to a candle." Entire sections of the book, such as "The City" and the "Meet Café," are narrative accounts of intoxication under yagé, a hallucinogen with rumored telepathic properties used by Amazonian Indians and described by Burroughs as "the final fix." In 1953, the writer had traveled deep into the jungles of Colombia and Peru in order to experience yagé, an expedition he described in *The Yage Letters*. In the yagé state, he had watched as "larval beings passed before my eyes in a blue haze, each one giving an obscene, mocking squawk," and ultimately reached a composite city "where all human potentials are spread out in a vast silent market." However, Burroughs was equally intrigued by the possibility of nonchemical means of attaining illusory experience. He read Grey Walter's *The Living*



Drawings of stroboscopic patterns compiled by John R. Smythies from subjects at the Psychological Laboratory, Cambridge, later published in the *British Journal of Psychology*. One notable subject was the philosopher, C. D. Broad.

CHAPEL OF EXTREME EXPERIENCE

Brain, and was fascinated that "consciousness-expanding experience has been produced by flicker." In an essay, "Points of Distinction Between Sedative and Consciousness-Expanding Drugs," he quoted from *The Living Brain*: "The rhythmic series of flashes appear to be breaking down some of the physiologic barriers between different regions of the brain. This means the stimulus of flicker received by the visual projection area of the cortex was breaking bounds—its ripples were overflowing into other areas." Wrote Burroughs: "Now, it is precisely this overflow of brain areas, hearing colors, seeing sounds, and even odors, that is a categorical characteristic of the consciousness-expanding drugs . . . With flicker Grey Walter has produced many of the [same] phenomena." Alluding to John Smythies' research combining a hallucinogen with stroboscopic light, Burroughs continued: "Further experiments with subliminal doses of mescaline accompanied by flicker . . . could well lead to a non-chemical method of expanding consciousness and increasing awareness."

When the poet Allen Ginsberg took LSD for the first time, under the supervision of researchers at the Mental Research Institute in Palo Alto, California, in 1959, Burroughs suggested he do so in concert with a stroboscope. The researchers consented, and connected the flicker machine to an EEG, so that Ginsberg's own alpha waves would trigger the flashes. Burroughs had the Japanese landscapes related by Huxley in *Heaven and Hell* in mind when he suggested the experiment, and while the synchronization did have an immediate and profound effect on Ginsberg, it was of an entirely different, ominous nature. Ginsberg recounted the experience to Martin A. Lee and Bruce Shalin, authors of *Acid Dreams*: "It was like watching my own inner organism. There was no distinction between inner or outer. Suddenly I got this uncanny sense that I was really no different than all of this mechanical machinery around me. I began thinking that if I let this go on, something awful would happen. I would be absorbed into the electrical network grid of the entire nation. Then I began feeling a slight crackling along the hemispheres of my skull. I felt

my soul being sucked out through the light into the wall socket." Ginsberg had the researchers turn the stroboscope off, but the apprehension remained with him. He felt caught in a web, and the spider was God or the devil. He wasn't sure which. Still high, he wrote the poem "Lysergic Acid," which began: "It is a multiple million eyed monster . . ." As Huxley wrote, visionary experience is not always blissful: "It is sometimes terrible. There is hell as well as heaven."

Recognizing the similarity to Brion Gysin's experience—the visions unleashed during his bus ride past an avenue of trees—Burroughs gave him a copy of *The Living Brain*. There, Gysin finally found the explanation for what he termed his "many million-to-one chance." At the time, the two men were engaged in a barrage of visual, aural, and literary experimentation in their rooms at the Beat Hotel. The potential of flicker became one of their many fascinations. Stroboscopic machinery was costly, cumbersome, and generally confined to the laboratory. Once he understood the scientific explanation for his random encounter with flicker, Gysin determined to find a way to mechanically reproduce the effect in a manner that could be mass produced. He saw in flicker the potential for human advancement. Gysin discussed it with Ian Sommerville, a mathematics student at Cambridge University and young boyfriend of Burroughs'. Sommerville had a genius for electrical improvisation, and indeed had a unique relationship with the electrical current: his thin blond hair often stood up as if a charge ran through it, he was not fond of water and found rain oddly menacing. Gysin asked Sommerville, "How can we make it at home? I mean, this is the problem. How can we do it with just what we've got?" He wanted to find a way, he said, to "make the ghosts walk in public." Sommerville had also read *The Living Brain*, and he and Burroughs sought out Walter, attending a lecture and speaking with him afterwards. Gysin similarly studied Grey Walter, including his work on cybernetics, from which he concluded the researcher had "gotten into a very Arthur Clarke sort of area." But Gysin made no effort to contact Walter:

"I never met him and he never had any other effect on me except that one thing he said, just in half a sentence, that people who are subjected to interruptions of light between 8 and 13 (cycles) a second reported experiences of color and pattern. I said, 'Oh, wow, that's it!'"¹⁶

On February 15, 1960, Sommerville wrote from Cambridge to inform Gysin that he had made "a simple flicker machine." By placing a cylinder with slots in it on a gramophone turntable at 78 rpm, then dangling a 100 watt light bulb inside so the light would flicker through the slits at a precise rate per second, Sommerville was able to replicate Gysin's experience:

Visions start with a kaleidoscope of colors on a plane in front of the eyes and gradually become more complex and beautiful, breaking like surf on a shore until whole patterns of color are pounding to get in. After awhile the visions were permanently behind my eyes and I was in the middle of the whole scene with limitless patterns being generated around me. There was an almost unbearable feeling of spatial movement for a while but it was well worth getting through for I found that when it stopped I was high above the earth in a universal blaze of glory. Afterward I found that my perception of the world around me had increased very notably.

Sommerville cautioned, however, that the experiences were not universal: "The intensity of the effect varies with the individual; melancholics tend to be irritated, some see nothing." Gysin and Sommerville subsequently experimented with different designs, one resembled a coliseum where each row spun at a different speed, and another attempted to spin at gradations from eight to thirteen flashes a second. A prototype of the device, to which Gysin added calligraphic painting to the interior cylinder, bore a resemblance to the Zoetrope, in design if not function, with vertical slots. But other designs were also developed, with "diamond" and "tulip" cut-outs. In each case, the device flickered at a constant rate to achieve the optimal effect described by Walter.

Gysin named it the Dream Machine, but later changed it to Dreamachine after he was advised the latter spelling would be more easily registered as a trade mark.

Brion Gysin was born in England in 1916, and raised in Edmonton, Alberta.¹⁷ A restless sophisticate, he received one of the first Fulbright fellowships, but his temperament made him ill-suited for the conventions of academia. It was Gysin who gave Alice B. Toklas her famous hash fudge recipe, promising “euphoria and brilliant storms of laughter; ecstatic reveries and extensions of one’s personality on several simultaneous planes.”¹⁸ In turn Toklas encouraged Gysin’s creative proclivities, assuring him he would have been “submerged, if not drowned, as a professor.”¹⁹ He instead opted for the life of an artist and writer. He lived in New York and spent years in Tangier, before settling into the Beat Hotel, a flop house at 9 rue Git le Coeur, Paris, so named by the poet Gregory Corso. Not only did Corso, Burroughs, and Gysin live there, but at various times so too did Ginsberg, and fellow poets Peter Orlovsky, and Harold Norse. It was at the Beat Hotel that Burroughs finished *Naked Lunch*. Gysin’s room was a center for “nightly gatherings and bizarre occurrences,” fueled primarily by a great deal of hashish. The effects could be astonishing. One time, Gysin and Burroughs witnessed a visiting literary critic transform into Soviet leader Nikita Khrushchev. Sometimes the alterations did not involve other people, but animals or aliens. There were examples of shared hallucination. In 1959 Burroughs wrote Ginsberg: “I have been making such incredible discoveries in the line of psychic exploration . . . What is happening now is that I literally turn into someone else not a human creature but man like—He wears some sort of green uniform . . . The face is full of black boiling fuzz and what most people would call evil . . . silly word . . . I have been seeing him for some time in the mirror . . . This is nothing of course . . . But when other people start seeing him without being briefed or influenced in any way . . . then something is really there . . . So far Brion has seen him (or it) . . .”²⁰ Such manifestations, amounting to what Burroughs termed “an alien

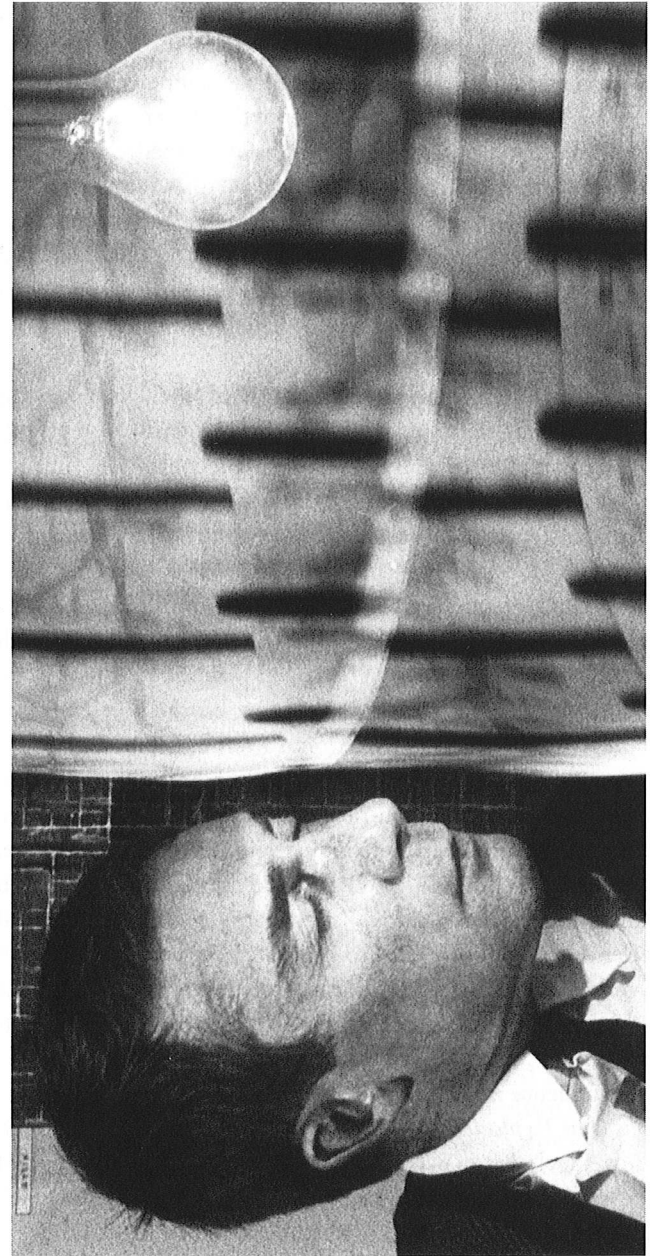


PHOTO COURTESY OF TOPHAM PICTUREPOINT/HAROLD CHAPMAN COPYRIGHT 2000

Brion Gysin, artist and writer, whose 1958 flicker trip down an avenue of trees in France inspired his subsequent development with Ian Sommerville of the Dream Machine. Shown with the Dream Machine at the Beat Hotel, Paris, in the early 1960s.

eruption," inspired their experiments in literature and in art, most notably in the use of cut-ups, an automatic writing technique developed by Gysin, where texts, including lines from Huxley's *The Doors of Perception*, were sliced up then the words randomly reassembled, heralding a means of escape from the convention of the novel where characters follow a contrived, artificial narrative line. Gysin and Burroughs collaborated on two books of cut-up experiments, *Minutes to Go*, and *The Exterminator*, and Burroughs went on to use the technique in a trilogy of cut-up novels, *The Soft Machine*, *Nova Express*, and *The Ticket That Exploded*.

Eric Mottram, professor of English at the University of London, noted that in addition to the cut-up method, "Burroughs also uses a fragmentation of continuous images developed from effects observed with Ian Sommerville's stroboscopic flicker-machine." The jacket blurb for the first edition of *The Soft Machine*, published in 1961, included a line written by Allen Ginsberg and originally published in his introduction to "Ten Episodes from *The Soft Machine*," which appeared in the Paris literary review *Olympia* No.1 that same year: "Stroboscopic flicker-lights playing on the Soft Machine of the eye create hallucinations, and even epilepsy. Recurrent flickering of Cut-Up opens up the era of hallucinations and makes a map for the human race to invade." Mottram, in *The Algebra of Need*, his critical examination of Burroughs' oeuvre, further argues "the use of Gysin and Sommerville's Dream Machine is central to Burroughs' conception of the non-verbal experiences of the body used to generate new prose style . . . its non-verbal effects displaced linear time and space, and it was exactly this that Burroughs could use as an extension of his cut-up methods."

The influence is most apparent in Burroughs' 1962 novel *The Ticket That Exploded*, and not only in prose style but content. The novel includes an account of a visit to the "neighborhood of the flicker ghosts," and an entire chapter, called "Writing Machine," is filled with beautiful, Dream Machine-induced imagery:

Photomontage fragments backed with iron stuck to patterns and fell in swirls mixing with color dust to form new patterns, shimmering, falling, magnetized, demagnetized to the flicker of blue cylinders pulsing neon tubes and globes—In metal booths brain waves wrote the flickering message passed back and forth, over and through shifting grills—The magnetic pencil caught in calligraphs of Brion Gysin wrote back into the brain metal patterns of silence and space—orgone accumulators flickering blue over swimming tanks where naked youths bathed in blue—sound and image flakes falling luminous grey snow—falling softly from demagnetized patterns into blue silence.

Burroughs continued, providing a virtual logbook of stroboscopic colors, patterns and illusory imagery:

Pools and canals reflected grey suits carrying umbrellas—flickering over swimming boys as the magnetic silver light popped sound and image flakes—color writing a composite garden—layers peel off red yellow blue pools reflecting translucent beings with flower hula hoops naked in blue twilight . . . In rooms flooded with sunlight panels of paintings moved past each other on conveyor belts to music all the masters of the world pass through each other in juxtapositions of light and color . . . flicker cylinders spilled light and talk and music across the water.

In *Nova Express*, published in 1964, the flicker machines are no longer merely a source of transcendent beauty. Burroughs has transformed them into an instrument of symbiotic experimentation and, ultimately, as a weapon in the war against control addicts:

Under vast revolving flicker lamps along the canals spill The Biologic Merging Tanks sense withdrawal capsules light and soundproof water at blood temperature pulsing in and out where two life forms slip in and merge to a composite being . . . Streets of mirror and glass and metal under flickering cylinders of colored neon—Projector towers sweep the city with color writing of The Painter— . . . five flashes per second—The rhythmic turrets destroy enemy installations—Cortex winds overflowing into mutinous areas . . .

For his part, Gysin concentrated on his art, and the fragmentation of continual images had no less an effect on the canvas than it had for Burroughs on the page. Gysin admitted the subject and style of his paintings were "utterly changed" by his experience with flicker. He produced calligraphic abstractions using grids inspired in part by his encounter with cabalistic squares in Moroccan magic, and in part by flicker imagery, the paintings often calibrated to the hot colors evoked at the optimal setting of ten flashes per second. Critic Edouard Roditi wrote: "Gysin now 'thinks' as if he were visualizing patterns created by his Dream Machine . . . his calligraphy acquires a fluency which almost suggests motion." He gave his paintings names like "Star of the Dreamachine," describing it as a "reference to what we see with our eyes shut. Experience other than by the senses. Things seen not with the eye but perceived under the stimulation of flickered light." Most notably, Gysin worked on producing Dream Machines—"the first artwork in history made to be viewed with closed eyes."

With the Dream Machine, Gysin intended to stimulate experience that was not only intensely pleasurable but also "instructive" to the viewer. The device would, he predicted, "open a new era and a new era of vision . . . interior vision," providing people with complete access to what he termed the "Human Programme." Gysin said that it allowed viewers to see "everything that can be seen, or has been seen, or will be seen." But in his view, people do not see beyond the limits of that program, they do not encounter the "incalculable." Instead, the Dream Machine evoked the vast store of symbols shared by humanity, "crosses, stars, halos . . . woven patterns like pre-Columbian textiles and Islamic rugs . . . rapidly fluctuating serial images of abstract art." Gysin described experiencing elaborate, highly structured visions induced by the apparatus, flashes of memory, 360 degree visions, and autonomous movies. He believed others would also encounter visions of faces, figures and enactment of pseudo-events: "I've had science fiction dreams, I've imagined that I was swimming over what seemed to be an ocean bottom and that big mollusks at the bottom opened up and through them appeared swimmers in

Leonardo da Vinci-type helmets, and a lot of dreams about fights between them, or flights of them." Ultimately, after experiencing hundreds of hours in front of the Dream Machine, Gysin concluded that he had been able to artificially reproduce an inventory of visual perception. He said: "I have seen in it practically everything that I have ever seen—that is, all imagery."

Gysin believed the Dream Machine's ability to heighten perceptions and stimulate and intensify brain function "may bring about a change of consciousness inasmuch as it throws back the limits of the visible world." He placed the Dream Machine in the context of discovery, describing it as "the very first exploration of one's own interior space." Walter had gone further in *The Living Brain*, suggesting that flicker had the potential to have produced an intellectual—even evolutionary—advance. He argued it was in "sunlight shining through the forest that we run the greatest risk of flicker-fits. Perhaps, in this way . . . our arboreal cousins, struck by the setting sun in the midst of a jungle caper, may have fallen from perch to plain, sadder but wiser apes." Gysin appended to this his own speculation about the potential of flicker experience: "One Ready Ape hit the ground and the impact knocked a word out of him . . . He spoke. In the Word was his beginning. He looked about and saw the world differently. He was one changed ape. I look about now and see this world differently. Colors are brighter and more intense—traffic lights at night glow like immense jewels. The ape became a man. It must be possible to become something more than a man."

• • •

In April 1961, Gysin demonstrated the Dream Machine to Allen Ginsberg at the Beat Hotel. It was the first time the two had met, although they knew of each other through Burroughs. Gysin had also benefited from Ginsberg's connection to Dr. Timothy Leary, a psychologist at Harvard University and director of the university's Center for Research in Personality. Months earlier, Ginsberg had tried psilocybin under Leary's supervision, and was

anxious to introduce other writers and artists to Leary's methods of mind expansion. Psilocybin had been synthesized several years earlier from magic mushroom extracts by Albert Hofmann, the discoverer of LSD. Ginsberg urged Leary to contact Burroughs, saying he knew more about drugs than anyone alive. Burroughs answered with a declaration that his writing "benefits from hallucinogens MEASUREABLY. Wider use of these drugs would lead to better work conditions on all levels." Burroughs enclosed a copy of *Minutes to Go*, and added: "I have made cut-up highs without chemical assistants. Brion Gysin who first applied the cut-up method to writing is here at the above address and would also be most interested to take the mushrooms."²¹

Gysin had prior experience with psychedelics. He had taken magic mushrooms as a child in western Canada, and mescaline for the first time in Tangier in 1954, with the result that he felt he had "experienced the power of magic." He shared some of the psilocybin sent to Burroughs, first taking two pills every hour for four hours. Gysin described feeling "elated, laughed a lot and had one color experience with a picture of my own which flushed and flooded with running tides of color. I have had much more extreme and rather perspicacious experiences with mescaline (detection of re-touches, frauds, etc.)." Two days later, he took another eight pills, but this time all at once, and wrote Leary with a description of his experiments: "Got high quickly and the confused high dropped so suddenly that I thought the experience was over but was later delighted with the sneaky little out of the corner of the eye effects of covert awareness which went on for some hours."²² A short time later a second package arrived from Leary, this one containing twenty-four tiny pink pills. Several days later Gysin took five pills and did three drawings in a notebook. He showed them to a French psychiatrist friend who, without being told, identified them as being "different."

In his letter, Gysin also took the opportunity to discuss stroboscopic light: "You may well know more about flicker machines than I do. If so, I would very much like to hear from you on the subject." In case Leary was unfamiliar with flicker, he described the design of a Dream Machine, adding: "I think that you will

find the superb 'interior display' of color interest. I have had several strange and one quite alarming experience with a long period of flicker. Color perception particularly of red traffic lights and neon at night remains heightened for 24 hours." Gysin ended with a request for some more of the pills: "I would very much like to try this and some aural-flicker I have invented and recorded by the BBC with psilocybin and anything else you might have to suggest."²³ Leary replied that he was grateful for Gysin's instructions on how to construct a flicker apparatus, and alluded briefly to his own encounter with flicker: "I wrote Burroughs about Harry Smith's movie which turned me on without. I'll set up a trial this weekend to see what happened."

Leary promised to send more pills, but first sent a package of papers, requesting that Gysin sign a document agreeing to the terms of the experiment and to report back on his experiences. Ginsberg wrote Leary in April that "Gysin has filled out and will send you his [form]. I don't know him well, and no intimate contact with him emotionally, tho (sic) Burroughs thinks we should dig each other." When more psilocybin did arrive, it was in a package addressed to Burroughs, who had by then relocated to Tangier. Gysin decided it was best not to leave such potent pills laying around: "Now that I knew more about the dose I decided to take all of them this time, all twenty-four of them. Better still, take just one tiny pill out of the bottle, stick it onto a card saying: 'I've taken 23 of these. If anything happens to me cable [Harvard] for instructions.'" Twenty-three was four times the maximum recommended dose. Gysin laid out his drawing and painting equipment on a large table that took up half his room. For the next thirty-six hours he experienced "three great bursts of calligraphy between long migrations of time travel and quite a few eerie moments."²⁴ He later described the experience in his novel, *The Process*: "As I went, I noticed the familiar fixtures of the mushroom world were flying past me much faster than I'd ever remembered them from childhood. I reached out through space for the notebook on my night-table to mark something down and I never got there."

Burroughs wrote to Ginsberg and asked: "Have you dug his

flicker machine? Great with the mushrooms." In fact, Ginsberg had already concluded that the results evoked by flicker alone were equal to pharmacologically-induced experience, the patterns corresponding to those produced by mescaline, psilocybin, and acid. It was an entirely different, more gentle, even fragile experience from his harsh, earlier encounter with the stroboscope. Ginsberg wrote Leary with his own account of the Dream Machine, explaining, "I looked into it—it sets up optical fields as religious and mandalic as the hallucinogenic drugs—literally . . . (look in with eyes closed)—it's like being able to have jeweled biblical designs and landscapes without taking chemicals. Amazing. It works."²⁵ Ginsberg added that he intended to try and connect Gysin with a manufacturer: "homemade optic movies possible." Leary, who was a tireless proselytizer for hallucinogenic drugs, appeared at first strangely apprehensive: "The stroboscope. It frightens me. Burroughs needs equipment to experiment." Leary was unsettled by the possibility that stroboscopic light could produce similar results to those attained by ingestion of extraneous substances. But he soon came around. In an essay, "How to Change Behavior," he wrote: "We have recently learned from W. Grey Walter and William Burroughs about photostimulation as a means of consciousness alteration. Concentrated attention to a stroboscope or flicker apparatus can produce visionary experience."

In May 1961, Timothy Leary wrote Aldous Huxley, who had also been participating in the psilocybin experiments, to inform him that "we are trying out some of Grey Walter's ideas." Huxley had previously urged the academic to study Walter's theories, and not only flicker, which Leary termed "the infused vision of the open cortex, flashing at speeds which far outstrip our verbal machinery." Huxley had met Walter in London, and Walter told him about experiments in psychosurgery, where electrodes had been placed in the brain of seriously ill mental patients. By switching on a battery in their pockets, the patients could stimulate their brain "and pass in the twinkling of an eye, from deepest depression to a broad grin." Remarked Huxley: "How unimaginative I was in *Brave New World*!" Leary was intrigued at the possibility that the neurologist could "wire up"

brains, and alter consciousness by pressing buttons. He described the phenomenon in *The Politics of Ecstasy*: "Press a button—make him hungry. Press a button—make him horny. Press a button—make him angry. Press a button—make him happy." Leary began to refer equally to the capacity of electrical and chemical stimuli to transform consciousness, but was astonished by what he judged as the potential of the electrical method to actually manipulate the brain's hallucinatory content: "Dr. Grey Walter can locate hallucinations. Let's say a peasant woman comes with a devil vision. Well, by precise manipulation of specific brain points . . . the doctor proceeds to remove the devil's horns, one by one, and then without horns the devil is just a man in her room. Well, then by precise manipulation of specific brain cells the devil's leer becomes a smile and then by further precise manipulations, the man gets to look familiar and, well . . . he eventually lays her right in the bed in which she is hallucinating and she has an orgasm, not one but several."

Ginsberg pursued the expansion of consciousness through use of various hallucinogens, and like Leary began to proselytize, viewing them as a useful tool for changing society. In a 1966 public address at the Arlington Street Church in Boston, Ginsberg declared that "everybody who hears my voice, directly or indirectly, try the chemical LSD at least once." Despite his view that hallucinogens like mescaline and yagé had allowed him to be transported to "unexplored psychic areas," Burroughs did not join in the crusade. Leary's pills had sent him on a bad trip. Asked by a friend how he was doing, Burroughs responded: "I would like to sound a word of warning. I'm not feeling too well. I was struck by juxtaposition of purple fire mushroomed from the Pain Banks. Urgent Warning. I think I'll stay here in shriveling envelopes of larval flesh . . . One of the nastiest cases ever processed by this department."²⁶

On August 23, 1961, Burroughs flew to the United States to participate, at Leary's invitation, on a panel at the annual meeting of the American Psychological Association. The symposium was on "Drugs and the Empirical Expansion of Consciousness," and while at Cambridge, Mass., Burroughs hoped to have the

opportunity to undertake further experiments, using stroboscopes, EEGs, or other techniques to access different psychic areas. But soon after his arrival, Burroughs concluded he was taking the proceedings a lot more seriously than was Leary, who declared in *High Priest*: "We are creating the Garden of Delights on the Harvard payroll. The Best Ever in Ivy League Drug Kicks. LOVE LOVE LOVE in slop buckets."

Burroughs (to Gysin): "The scene here is really frantic. Leary has gone berserk. He is giving mushrooms to hat-check girls, cabdrivers, waiters, in fact anybody who will stand still for it."²⁷ Burroughs described his negative reaction to psilocybin, and railed against it: "Horrible stuff! I went through the ovens with it. I'll never take it again!"

Leary's response (to Ginsberg): "From the moment Bill hit the USA he started putting mushrooms down . . . He declined to join our game—which is developing into a religious, do-good cult, etc." When Burroughs returned to Paris looking even more glum than usual, he told Gysin that his views were diametrically opposed to Leary's and that he had told the Harvard professor as much. Gysin delighted at the thought: "Tim's incandescent grin must have dropped off his face for a minute or two but he was always so swept away by himself that he may not have heard him. He was so busy spreading around the good word and popping tiny pills of psilocybin into not only willing mouths but unwanting ones and so high all the time that he just went on loving Burroughs. That's what he was preaching anyway, love. He loved everyone. Not William."²⁸

Leary's love eventually encompassed Gysin, who he described in his memoir *Jail Notes* as "one of the great hedonic mystic teachers. He has played starring roles in the great spiritual movies of our times." Leary even came to love the Dream Machine, describing it as "the most sophisticated neurophenomenological device ever designed." The Dream Machine was sophisticated in its effects, but rudimentary in its design, and it was not always mechanically reliable. Peter Orlovsky had written Leary that he wanted to view it after consuming

some psilocybin pills: "Now that I am high, would like to see this flicker . . . but it's being fixed." Ginsberg wrote Orlovsky in August to encourage him to go ahead and make his own—he described it admiringly as "home-made strobe"—and he added that Gysin made it sound much more complicated than it really was: "You just get a cylinder of black paper & divide it in twenty squares and cut out 10 of them around the roll and that's that."²⁹

• • •

Inspired by their flicker response, other writers joined Burroughs in recording vivid accounts of their experiences. The young New York poet and photographer Ira Cohen looked into the "dream funnel" while visiting Gysin in Paris in 1962, and noted that almost immediately "the craziest cartoons began to unreel, images from the deepest core became after image reality, the real Flintstones in paleolithic time, surrealist fantasies wrapped in science fiction . . . You are in constant flux, in a state of spiritual liquefaction . . ." During one demonstration, also in 1962, Norman Lewis Glass, an English writer, experienced the effect through both open and closed eyes:

I shut my eyes so that the flickering light fell on my closed lids. At once, brilliant red spots jumped on and off a misty, light blue background. The color changed and the pattern developed into complex mosaics of clear shining brilliance—an unending variety of patterns. I opened my eyes and saw Gysin on the other side of the spinning machine. Parts of his face appeared to break through the windows and grow in size while the colors and bits of his own whirling design inside the cylinder intermingled with cut-up bits of his features. At one moment his face appeared within the cylinder; motionless and transformed, his image appeared to have been substituted for the bulb while colors erupted and rejoiced around it.

Glass found Gysin's obsession with becoming "something more than a man" remarkable, but judged it a "core conviction

unspoilt by arrogance. There is nothing Nietzschean about Gysin. On the contrary, he believes that only by man becoming superhuman will he ever learn to be properly human . . . only by man's jump into the unknown will he arrive to understand and manage the known."

The Dream Machine was introduced to a wider public in *Olympia* No. 2, released in February 1962. Two essays, "The Dream Machine" by Gysin, and Ian Sommerville's "Flicker" were published along with do-it-yourself plans and instructions for the simple-to-construct device. Wrote Gysin: "What is art? What is color? What is vision? These old questions demand new answers when, in the light of the Dream Machine, one sees all of ancient and modern abstract art with eyes closed. In the Dream Machine nothing would seem to be unique. Rather, the elements seen in endless repetition, looping out through numbers beyond number and back, show themselves thereby a part of the whole. This, surely approaches the vision of which the mystics have spoken." In his original journal entry made following his bus ride, Gysin described the feeling of being "out in a world of infinite number." In *Olympia*, he argued that Marcel Duchamp was "the first to recognize an element of the infinite in the *Ready-made*—our industrial objects manufactured in 'infinite' series." In 1925, Duchamp constructed his own optical machine, the Rotary Demisphere, a disc with a spiral pattern enclosed in a convex glass hemisphere, which was rotated by a motor to create illusions of three-dimensional, concave and convex spiral forms. Duchamp was reacting to art as a "purely retinal" experience, yet the artwork, and later optical machines such as the 1935 Rotoreliefs, which he exhibited at an inventor's fair instead of an art gallery to emphasize their commercial potential, were ultimately purely retinal experiences. Where Gysin saw a similarity with Duchamp was in the notion of the infinity of art: "The Dream Machine may very well show you an eternal series of gas jets burning with an unearthly flame, but to dub an individual gas jet a 'unique art object' by adding the artist's signature, is to make the elementary mistake of taking the

merely tangible world for the visible world." He elaborated in a later article, written with Sommerville: "'Flicker' creates a dazzling multiplicity of images in constantly altering relationships which makes the 'collages' and 'assemblages' of so-called 'modern' art appear utterly ineffectual and slow. Art history as the enumeration of individual images ended with the direct introduction of light as the principal agent in the creation of images which have become infinitely multiple, complex and all-pervading. Art history has come to an end." The Dream Machine was not intended to be an artwork. It was all artwork.

Both Gysin and Sommerville, in their essays, focus on light. Wrote Gysin: "My first experience of natural flicker through the trees made me realize that the one and only thing which cannot be taken from the picture is light—everything else can be utterly transmuted or can go." Sommerville added: "The intense and even overwhelming effects of colored pattern seen under stimulation must be distinguished from the 'hallucinations' known in psychiatry, as well as from those visions which bring about permanent personality change. However, recorded mystic visions, perhaps due to a metabolic state as suggested by Aldous Huxley, often mention these same dazzling lights. St. Augustine wrote: 'And thou didst beat back the infirmity of my own eyes, darting thy beams of light upon me most strongly and I trembled . . .'" Huxley had, in fact, identified two separate forms of light encountered during visionary experience, undifferentiated light, where everything is simply flooded with light, and differentiated light, light contained in objects, light that would shine out of things. It was the latter classification that he applied to flicker. Wrote Huxley: "On its simplest level this is a kind of luminous living geometry."

Dream Machine prototypes attracted considerable attention when they were first publicly exhibited among neo-dada objects at the Antagonismes Salon in Paris. At Galleria Trastevere in Rome, Gysin constructed what he termed a "Chapel of Extreme Experience," a cubic space entirely lined with his paintings, in the middle of which spun a Dream Machine. He

completed the sensory bombardment by playing tapes of electronically speeded repetitive or permutative poems. The installation opened on February 2, 1962, and a laudatory review in *Art International* described Gysin as an artist interested in the "structural problems of sensation." The official unveiling, however, was reserved for an exhibit titled "L'Object" at the Louvre's Musée des Arts Decoratifs, Paris, in March. In the *Herald Tribune*, Naomi Barry reported that the "big hit of the show is certainly the dream machine. Like moths, the visitors are drawn to the whirling, flashing black cylinder on a turntable. A few minutes later some of them move back giddily. Others just wander away in a smiling trance . . . color and pattern flash by like a bright street scene out of the windows of an elevated train." The reviewer added that with eyes closed, "the colors go on exploding like an intense kaleidoscope of enlarging patterns. Very pleasurable."

Gysin enthusiastically demonstrated the Dream Machine to prospective patrons, among them beautician Helena Rubinstein and the art collector and patron Peggy Guggenheim. Rubinstein had an immediate visceral response to the Dream Machine, achieving a dream state on her first viewing. She's the only person Gysin knew who had all the visions appear like films: "Madame would say, 'Oh yes, I had a boat trip. Oh yes, I'm in a speed boat between Venice and the airport. Oh, I'm taking the train in Venice. Ooh, I'm on a . . .'" Rubinstein's secretary, Patrick O'Higgins, was fascinated by the device and arranged to have it spinning at several of Rubinstein's functions, including a fashion show on her roof garden, and at a breakfast for clients in the grand salon. Gysin wrote a friend, the writer and editor Charles Henri Ford, on February 20, 1963 declaring: "I would seem to have pushed the beauty business into a new field. Patrick O'Higgins is, of course, the brains behind it. He dug the Dream Machine right away. Well, as Madame says: 'One never knows.' It will certainly work out."³⁰ For a while a prototype was displayed in the window of Rubinstein's boutique, but it did not work out. She would not pay for it and eventually Gysin had to demand it



PHOTO COURTESY OF TOPHAM PICTUREPOINT/HAROLD CHAPMAN COPYRIGHT 2000

Ian Sommerville, shown in his room at the Beat Hotel, Paris.

back. He took one to show Peggy Guggenheim at her palazzo in Venice, but Alfred Barr of the Museum of Modern Art was present, and said: "The kinetic thing is over, what it is now is Pop."

Gysin was undaunted. He did not view it strictly as an artwork. Nor did he see it as a novelty item in the manner of the later fad for Lava Lamps. Gysin imagined a Dream Machine in every suburban home, in the spot formerly occupied by the television set, but broadcasting inner programming. "Mass production right away has always been the question," he said. To protect the invention, he applied for a patent and received brevet no. P.V. 868,281 July 18, 1961, for a "procedure and apparatus for the production of artistic sensations." The description read, in part: "This invention, which has artistic and medical application, is remarkable in that perceptible results are obtained when one approaches one's eyes, either opened or closed, to the outer cylinder slotted with regularly spaced openings revolving at a determined speed. These sensations may be modified by a change in speed, or by a change in disposition of the slots, or by changing the colors and patterns on the interior of the cylinder . . ." The Philips Corporation entertained the possibility of manufacturing and marketing it, and was serious enough to have dispatched an executive to Paris to investigate. Gysin felt he was only days away from signing a contract of intent with the company, "and soon after that the Dreammachines and the money will spin out"—but the deal collapsed. Gysin believed it was because the businessman had slipped on dog excrement in a hallway at the Beat Hotel.

• • •

In 1964, Gysin exhibited the Dream Machine at a small gallery in Tangier, Morocco. Leila Hadley, an elegant young American adventurer and author of travel narratives, such as *Give Me the World* and *A Journey with Elsa Cloud*, heard about it from a British student at a café. Hadley, whose earlier travel to Spain with her three young children had been the subject of an eight-

page fashion spread in that March's issue of *Harper's Bazaar*, had just arrived in Tangier. The student said the Dream Machine was better than mushrooms or mescaline, and urged her to try it. Hadley went to the gallery. There was a card in Arabic, French and English explaining that it should be viewed through closed eyes. She was initially put off: "It didn't look like much—a pierced vinyl cylinder with a light bulb suspended in it and a revolving base. French teeny-boppers and people you'd see at the Parade bar and faces which would be seen again at the coffee tables along the Boulevard Mohammed V stood around it, and after awhile I did, too." She felt faintly foolish closing her eyes and holding her face so close that she could feel the air stirring as the machine revolved, but after a short time she was startled by flashing colors, and patterned designs. Hadley kept a detailed record of her later experiments with the Dream Machine, which produced an illusion of 360 degree vision, and evoked an emotional response: "A curiously pure and thrilling effect, the sensation of enjoying some sort of spiritual sex with no urgency, no pressure of wanting to gain greater or deeper pleasure." Hadley also experienced complex, remarkably detailed visions: "A Georgian house with a columned porch. White columns, the porch of colored stone, jewel-like stone . . . A woman with a peacock walked without moving along the porch, keeping her place but seeming to walk. She was wearing a mantle of cloth of gold. It was a scene I felt I was seeing across a garden, very real but with a sort of magical quality as if a Crivelli painting or a Persian miniature has just been 'brought to life,' the sort of scene if came upon in a foreign country you would know, as you saw it, had been imprinted in your mind." Hadley became convinced of the commercial potential of what she termed the "holy fire" unleashed by the device, and determined to help market it. She proposed the establishment of a Dream Machine Corporation, and invited Gysin to New York. He said he would also bring his "assistant" Ian Sommerville, "an invaluable technical sergeant & I would consider cutting him in for 10 percent, to be discussed, of course." Ultimately,

Sommerville did not accompany him, and the writer Alan Ansen, for one, felt that "Brion always gave himself a little too much credit" for the invention of the Dream Machine, to the exclusion of Sommerville. The poet Harold Norse, who did much to encourage the dissemination of Gysin's and Burroughs' cut-up experiments, agreed: "Without Ian Sommerville's scientific imagination and expertise Gysin could not have realized his Dreamachine, which provided a drugless high."

Gysin traveled to New York late in 1964, convinced that a manufacturer would be found, and the Dream Machine would soon be "spinning all over the world." Paul Bowles, the author of *The Sheltering Sky* and a longtime friend of Gysin's, was more restrained about its potential. He predicted only that the device "promises a new kick to the juvenile delinquents." Another friend, the English writer Felicity Mason, added it "turned into anything you cared to imagine and quite a few things you didn't." Even Burroughs was skeptical of the likelihood of achieving mass distribution or ever generating any money from it, unless, he said dryly, Gysin was prepared to "get a little shop and go into the business of making lampshades, rotating lampshades." Ensnared in the Chelsea Hotel, Gysin began to demonstrate the Dream Machine to visitors. He and "Chelsea novelist" Burroughs were featured in a photo spread in the *New York Herald Tribune*, with the "unique new 'dream machine.'" The device was also shown to the Andy Warhol group. One intimate of Gysin's from the Warhol scene was John Giorno, a young former Wall Street stockbroker turned poet, and recent star of Warhol's six-hour film epic *Sleep*. Giorno met Gysin at a party for Burroughs. They were drunk or stoned, or both, and shared an immediate, extreme attraction. Gysin asked Giorno to call him at the Chelsea. A few days later they embarked on a series of acid trips together, Gysin's interest in psychedelic drugs having progressed from psilocybin to LSD.

Hadley, who traveled not only to the distant corners of the globe, but in New York society circles (she later married Henry Luce III), did all she could to promote the invention, enlisting

the help of friends, and hosting parties at which Gysin was the star attraction. Among those who experienced the Dream Machine were Henry Grunwald, editor-in-chief of *Time* and later U.S. ambassador to Austria, and the filmmaker Felix Jackson. Hadley also found Gysin an agent, Peter Matson, who immediately proposed that large Dream Machines be mounted on New York rooftops to conceal water towers. It was intended as a joke, but Gysin said he liked the idea. Matson suspected Gysin was not as serious about the Dream Machine as he pretended, but was enjoying seeing how far he could push an outrageous scheme. On December 10, a meeting was convened at Peter Matson's offices to discuss the Dream Machine. Three representatives of Columbia Records were present, and they were joined by one executive each from Pocketbooks and Random House. The initial response was skeptical. Leonard Burkett, creative services director at Columbia Records, asked, "How do we play the game?" But when Gysin turned on two machines in the room, and everyone began to view them with open or closed eyes, moving their heads up and down for different effects, they elicited a "sparkling of ideas and enthusiasm." All present were soon trying to understand what they had and how to market it. Was it something that could be sold in book form with cut-outs, or was it something that could be sold with LPs? Columbia Records' advertising director Alvin Goldstein suggested the Dream Machine would make a great lamp. Someone said they could be used in window displays. Gysin put on a marvelous show, Hadley recalled, not only presenting his flicker machine, but telling his incredulous audience that one day records would be played without needles, that instead an "electronic eye" would scan the disc. Of this the executives were, notes from the meeting show, "skeptical."³¹ Other viewings of the Dream Machine were organized for prospective manufacturers, including toy company managers. Eventually, illumination engineer Richard Kelly took blueprints to study. In August 1965, Gysin entered into an agreement with him for the "development and exclusive making of

Dreamachines.” Hadley wrote Gysin that “Richard Kelly is a darling . . . He is wild about the dream machine which is on his dining room table and looks great, and he is doing improvements, but all at his own time which is turtle-like, so there is no money from there at the moment.”³²

Gysin also prepared a book proposal about flicker, and an editor at Random House promised to consider it. Gysin and Burroughs had intended to include a chapter on the device in *The Third Mind*, an expository tract about their collaborations, and to illustrate the concept they produced a collage, combining calligraphy, photographs of the Dream Machine, images of aboriginal youths cavorting in the nude, and a newspaper clipping announcing “Machine Manufactures ‘Dreams,’” all overlaid on a grid. The text for the planned chapter, including lines from Somerville’s “Flicker” essay which had appeared in *Olympia*, and which is heavily indebted to Grey Walter, was ultimately published in 1969 in Burroughs’ *The Job*, credited to Gysin. It elaborated on a link between flicker and television made by Burroughs in an interview published in *Paris Review* in 1965. Television, said Burroughs, is “a real cut-up.” “It flickers, just like the old movies used to . . . Gysin has been experimenting with the flicker principle in a gadget he calls a ‘Dream Machine.’” The text described:

Extending fields of colored pattern which develop throughout the entire visual field, 360 degrees of hallucinatory vision in which constellations of images appear. Elaborate geometric constructions of incredible intricacy build up from multi-dimensional mosaic into living fireballs like the mandalas of Eastern mysticism or resolve momentarily into apparently individual images and powerfully dramatic scenes like brightly colored dreams. Our ancestors saw the creatures of the constellations in the apparently unorganized distribution of the stars. It has been shown experimentally through the viewing of random white dots on a screen that man tends to find pattern and picture where objectively there is none: his mental process shapes what it sees. The alpha rhythms, at about 13 per second, are

PHOTO COURTESY OF LEILA HADLEY



Leila Hadley, writer and traveler, became an advocate of the commercial potential of the Dream Machine after viewing it at a small gallery in Tangier, while traveling with her children in North Africa. Shown here in the mid-1960s.