

WRITING WORTH READING • ISSUE 29 • AUGUST 2008

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Martin A. Lee is the author of *Acid Dreams: The Complete Social History of LSD: The CIA, the Sixties, and Beyond*.

He is writing a social history of marijuana. A version of this article originally appeared in *Cannabis Culture*.

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SYNTHETIC POT AS A MILITARY WEAPON?

Meet the man who ran America's secret program

BY MARTIN A. LEE

Dr. James Ketchum tested a potent form of synthetic marijuana on soldiers to develop a secret weapon in the '60s. Now he's telling the tale

It was billed as a panel discussion on "the global shift in human consciousness." A half-dozen speakers had assembled inside the Heebie Jeebie Healers tent at Burning Man, the annual post-hippie celebration in Black Rock, Nev., where 50,000 stalwarts braved intense dust storms and flash floods last August. Among the notables who spoke at the early evening forum was Dr. Alexander "Sasha" Shulgin, the Bay Area-based psychochemical genius much beloved among the Burners, who synthesized Ecstasy and 200 other psychoactive drugs and tested each one on himself during his unique, offbeat career.

Sitting on the panel next to Shulgin was an unlikely expositor. Dr. James S. Ketchum, a retired U.S. Army colonel, told the audience, "When Sasha was trying to open minds with chemicals to achieve



Top military officers hyped the notion of "war without death," conjuring visions of aircraft swooping over enemy territory releasing clouds of "madness gas" that would disorient the bad guys and dissolve their will to resist, while U.S. soldiers moved in and took over

greater awareness, I was busy trying to subdue people."

Ketchum was referring to his work at Edgewood Arsenal, headquarters of the U.S. Army Chemical Corps, in the 1960s, when America's national security strategists were high on the prospect of developing a nonlethal incapacitating agent, a so-called humane weapon, that could knock people out without necessarily killing anyone. Top military officers hyped the notion of "war without death," conjuring visions of aircraft swooping over enemy territory releasing clouds of "madness gas" that would disorient the bad guys and dissolve their will to resist, while U.S. soldiers moved in and took over.

Ketchum was into weapons of mass elation, not weapons of mass destruction. He oversaw a secret research program that tested an array of mind-bending drugs on American GIs, including an exceptionally potent form of synthetic marijuana. (Most of these drugs had no medical names, just numbers supplied by the Army.) "Paradoxical as it may seem," Ketchum asserted, "one can use chemical weapons to spare lives, rather than extinguish them."

Some of the Burners were perplexed. Was this guy cool or creepy?

Shulgin, a critic of chemical mind-meddling by the military, was wary when he first met Ketchum at a 1993 event honoring the 50th anniversary of the discovery of LSD. But Ketchum is not your typical military bulldozer type. An intelligent, gracious man with a disarming sense of humor, in his own way he has always been a free spirit. He and his wife, Judy, who currently reside in Santa Rosa, became close friends with Sasha and his formidable partner, Ann. They stayed in frequent contact and occasionally socialized together. When the Shulgins invited them to Burning Man, the Ketchums joined the caravan of RVs driving to the desert.

"I'm kind of a Sasha worshipper," Ketchum, who reads neuropharmacology textbooks during his leisure hours, confessed. Tall and lanky, the colonel, now 76, is one of the few people who can actually understand what Shulgin, six years his senior, is talking about when he lectures on the molecular subtleties of psychedelic drugs, waving his arms furiously like a mad scientist. Shulgin took Ketchum under his wing and welcomed him into the fold.

Shulgin wrote the foreword to Ketchum's self-published memoir, *Chemical Warfare: Secrets Almost Forgotten*, which lifts the veil on the Army's little-known drug experiments and illuminates a hidden chapter of marijuana history. A graduate of Cornell Medical College, Ketchum describes how he was assigned as a staff psychiatrist to Edgewood Arsenal, located 25 miles northeast of Baltimore, in 1961.

"There was no doubt in my mind that working in this strange atmosphere was just the sort of thing that would satisfy my



"The dog gets a peculiar reaction. He crawls under the table, stays away from the dark, leaps out at imaginary objects and, as far as one can interpret, may be having hallucinations," one report stated.

"It would appear even to the untrained observer that this dog is not normal. He suddenly jumps out, even without any stimulus, and barks, and then crawls back under the table"

appetite for novelty," Ketchum wrote. Soon he became chief of clinical research at the Army's hub for chemical warfare studies. Although the Geneva Convention had banned the use of chemical weapons, Washington never agreed to this provision, and the U.S. government poured money into the search for a nonlethal incapacitant.

Red Oil

The U.S. Army Chemical Corp's marijuana research began several years before Ketchum joined the team at Edgewood. In 1952, the Shell Development Corporation was contracted by the Army to examine "synthetic cannabis derivatives" for their incapacitating properties. Additional studies into possible military uses of marijuana began two years later at the University of Michigan medical school, where a group of scientists led by Dr. Edward F. Domino, professor of pharmacology, tested a drug called "EA 1476" — otherwise known as "Red Oil" — on dogs and monkeys at the behest of the U.S. Army. Made through a process of chemical extraction and distillation, Red Oil, akin to hash oil, packed a mightier punch than the natural plant.

Army scientists found that this concentrated cannabis derivative produced effects unlike anything they had previously seen. "The dog gets a peculiar reaction. He crawls under the table, stays away from the dark, leaps out at imaginary objects and, as far as one can interpret, may be having hallucinations," one report stated. "It would appear even to the untrained observer that this dog is not normal. He suddenly jumps out, even without any stimulus, and barks, and then crawls

back under the table.”

With a larger dose of Red Oil, the reaction was even more pronounced. “These animals lie on their side; you could step on their feet without any response; it is an amazing effect and a reversible phenomenon. It has greatly increased our interest in this compound from the standpoint of future chemical possibilities.”

In the late 1950s, the Army started testing Red Oil on U.S. soldiers at Edgewood. Some GIs smirked for hours while they were under the influence of EA 1476. When asked to perform routine numbers and spatial reasoning tests, the stoned volunteers couldn’t stop laughing.

But Red Oil was not an ideal chemical-warfare candidate. For starters, it was a “crude” preparation that contained many components of cannabis besides psychoactive THC. Army scientists surmised that pure THC would weigh much less than Red Oil and would therefore be better suited as a chemical weapon. They were intrigued by the possibility of amplifying the active ingredient of marijuana, tweaking the mother molecule, as it were, to enhance its psychogenic effects. So the Chemical Corps set its sights on developing a synthetic variant of THC that could clobber people without killing them.

Enter Harry Pars, a scientist working with Arthur D. Little Inc., based in Cambridge, Mass., one of several pharmaceutical companies that conducted chemical warfare research for the Army. (Two Army contracts for marijuana-related research were awarded to this firm, covering a 10-year period beginning in 1963.) A frequent visitor to Edgewood, Pars synthesized a new cannabinoid compound, dubbed “EA 2233,” which was significantly stronger than Red Oil.



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At the outset of this project, Pars had sought the advice of Shulgin, then a brilliant young chemist employed by Dow Chemical. Shulgin was a veritable fount of information regarding how to reshape psychoactive molecules to create novel mind-altering drugs. Eager to share his arcane expertise, Shulgin gave Pars the idea to tinker with nitrogen analogs of tetrahydrocannabinol (THC). Pars never told Shulgin that he was an Army contract employee. A declassified version of Pars’ research was published in the *Journal of the American Chemical Society* (August 1966), in which he thanked Shulgin for “drawing our attention to the synthesis of these nitrogen analogs.”

The U.S. Army Chemical Corps began clinical testing of EA 2233 on GI volunteers in 1961, the year Ketchum arrived at Edgewood Arsenal. When ingested at dosage levels ranging from 10 to 60 micrograms per kilogram of body weight, EA 2233 lasted up to 30 hours, far longer than the typical marijuana buzz.

“I Just Feel Like Laughing”

In an interview videotaped seven hours after he had been given EA 2233, one soldier described feeling numb in his arms and unable to raise them, precluding any possibility that he could defend himself if attacked. “Everything seems comical,” he told his interlocutor.

Q: How are you?

A: Pretty good, I guess. ...

Q: You’ve got a big grin on your face.

A: Yeah. I don’t know what I’m grinning about, either.

Q: Do things seem funny, or is that

just something you can't help?

A: I don't — I don't know. I just — I just feel like laughing. ...

Q: Does the time seem to pass slower or faster or any different than usual?

A: No different than usual. Just — just that I mostly lose track of it. I don't know if it's early or late.

Q: Do you find yourself doing any daydreaming?

A: Yeah. I'm daydreaming all kinds of things. ...

Q: Suppose you have to get up and go to work now. How would you do?

A: I don't think I'd even care.

Q: Well, suppose the place were on fire?

A: It would seem funny.

Q: It would seem funny? Do you think you'd have the sense to get up and run out, or do you think you'd just enjoy it?

A: I don't know. Fire doesn't seem to present any danger to me right now. ... Everything just seems funny in the Army. Seems like everything somebody says, it sounds a little bit funny. ...

Q: Is it like when you're in a good mood and you can laugh at anything?

A: Right. ... It's like being out with a bunch of people and everybody's laughing. They're just —

Q: Having a ball?

A: Yeah. And everything just seems funny.

Q: Would you do this again? Take this test again?

A: Yeah. Yeah. It wouldn't bother me at all.



Given the high safety margin of THC — no one has ever died from an overdose — and the likelihood that the stereoisomers would display a similar safety profile, Ketchum believes the Army may have spurned a couple of worthy prospects that were capable of filling the knock-'em-out-but-don't-kill-'em niche in America's chemical warfare arsenal

EA 2233 was actually a mixture of eight stereoisomers of THC. (An isomer is a re-arrangement of atoms within a given molecule; a stereoisomer entails different spatial configurations of these atoms.) Eventually, Edgewood scientists would separate the eight stereoisomers and investigate the relative potency of each of them individually in an effort to separate the wheat from the psychoactive chaff and reduce the amount of material needed to get the desired effect for chemical warfare.

Only two of the stereoisomers proved to be of interest (the others didn't have much of a knockdown effect). When administered intravenously, low doses of these two synthetic cousins of tetrahydrocannabinol triggered a dramatic drop in blood pressure to the point where test subjects could barely move. Standing up without assistance was impossible. This was construed by cautious Army doctors as a warning sign — a sudden plunge in blood pressure could be dangerous — and human experiments with single THC stereoisomers were suspended.

Looking back on these studies, Ketchum wonders whether his colleagues made the right decision. "This hypotensive (blood-pressure-reducing) property, in an otherwise nonlethal compound, might be an ideal way to produce a temporary inability to fight, or do much else, without toxicological danger to life," Ketchum says now. Given the high safety margin of THC — no one has ever died from an overdose — and the likelihood that the stereoisomers would display a similar safety profile, Ketchum believes the Army may have spurned a couple of worthy prospects that were capable of filling the knock-'em-out-but-don't-kill-'em niche in America's

chemical warfare arsenal.

As for the two exemplary stereoisomers weaned from EA 2233, Ketchum speculates, “They probably would have been safe in terms of life-sparing activity. ... But a person who received them would have to lie down. If he tried to stand up and get his weapon, he would feel faint and light-headed and he’d keel over. Essentially he would be immobilized for any military purpose until the effects wore off.”

The colonel’s assessment: “A safe drug that knocks people down — what more could you ask for?”

Volunteers for America

With THC isomers on the back burner, the U.S. Army Chemical Corps focused on several other compounds — including LSD, PCP, methylphenidate (Ritalin) and a delirium-inducing ass-kicker known as “BZ” (a belladonna-like substance similar to atropine) — all of which were thought to have significant potential as nonlethal incapacitants.

By the time the clinical testing program had run its course, 6,700 volunteers had experienced some bizarre states of consciousness at Edgewood. Under the influence of powerful mind-altering drugs, some soldiers rode imaginary horses, ate invisible chickens and took showers in full uniform while smoking phantom cigars. One garrulous GI complained that an order of toast smelled “like a French whore.” Some of their antics were so over-the-top that Ketchum had to admonish the nurses and other medical personnel not to laugh at the volunteers, even though it was unlikely that the soldiers would remember such incidents once the drugs wore off.



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Ketchum insists that the staff at Edgewood went to great lengths to ensure the safety of the volunteers. (There was one untoward incident involving a civilian volunteer who flipped out on PCP and required hospitalization, but this happened before Ketchum came on board.) During the 1960s, every soldier exposed to incapacitating agents was carefully screened and prepped beforehand, according to Ketchum, and well treated throughout the experiment. They stayed in special rooms with padded walls and were monitored by medical professionals 24/7. Antidotes were available if things got out of hand.

“The volunteers performed a patriotic service,” Ketchum says. “None, to my knowledge, returned home with a significant injury or illness attributable to chemical exposure,” though he admits that “a few former volunteers later claimed that the testing had caused them to suffer from some malady.” Such claims, however, are difficult to assess given that so many intervening variables may have contributed to a particular problem.

A follow-up study conducted by the Army Inspector General’s office and a review panel convened by the National Academy of Sciences found little evidence of serious harm resulting from the Edgewood experiments. But a 1975 Army IG report noted that improper inducements may have been used to recruit volunteers and that getting their “informed consent” was somewhat dubious given that scientists had a limited understanding of the short- and long-term impact of some of the compounds tested on the soldiers.

Ketchum draws a sharp distinction between clinical research with human subjects under controlled conditions at Edgewood Arsenal and the CIA’s reckless

experiments on random, unwitting Americans who were given LSD surreptitiously by spooks and prostitutes. “Jim is very certain of his own integrity,” says Ken Goffman, aka R.U. Sirius, the former editor of the psychedelic tech magazine *Mondo 2000*. “There is little doubt in his mind that he was doing the right thing. He felt he was working for a noble cause that would reduce civilian and military casualties.” Goffman helped Ketchum edit and polish his book manuscript, which vigorously defends the Edgewood research program.

Strange bedfellows, the colonel and the counterculture scribe. Or so it would appear. But these days, Ketchum and Goffman see eye to eye on many issues. Both feel that the alleged dangers of marijuana and LSD have been way overblown. No doubt, LSD could wreak havoc on the toughest, best-trained troops, derailing their thought processes and disorganizing their behavior.

When used wisely, however, LSD can be uplifting. Ketchum notes that some soldiers had insightful and rewarding experiences on acid, lending credence to reports from civilian psychiatrists that LSD was a useful therapeutic tool. “I had an interest in psychedelic drugs long before my interest in chemical warfare,” Ketchum says. “I was intrigued by the positive aspects of LSD, as well as the incapacitating aspects.”

Mystery Stash

One morning, Ketchum arrived at his office in Edgewood and found “a large, black steel barrel, resembling an oil drum, parked in the corner of the room,” he recounts in his book. Overcome by curiosity,



Some officers at Edgewood were dipping into the Army's stash for their own personal use.

“They took LSD more often than was necessary to appreciate its clinical effects,” Ketchum admits.

“They must have liked it”

he opened the barrel and examined its contents. There were a dozen tightly sealed glass canisters that looked like cookie jars; the labels on the canisters indicated that each contained about three pounds of “EA 1729,” the Army’s code number for LSD. By the end of the week, the 40 pounds of government acid — enough to intoxicate several hundred million people — vanished as mysteriously as it had appeared. Ketchum still doesn’t know who put the LSD in his office or what became of it.

But this much is certain: Some officers at Edgewood were dipping into the Army’s stash for their own personal use. “They took LSD more often than was necessary to appreciate its clinical effects,” Ketchum admits. “They must have liked it.”

The colonel was personally a bit skittish about trying LSD. Eventually, he worked up the courage to experiment on himself. Under the watchful eye of a knowledgeable Edgewood physician, he swallowed a small dose and proceeded to take the same numerical aptitude tests that the regular volunteers were put through to measure their impairment. Constrained by the white-smock laboratory setting, his lone LSD experience was somewhat anticlimactic. “Colors were more vivid and music was more compelling,” Ketchum recalls, “but there were no breakthroughs in consciousness, no Timothy Leary stuff.

Ketchum also sampled cannabis shortly after he began working for the Chemical Corps. His younger brother turned him on to marijuana, but the first time Ketchum smoked a joint nothing happened. “Later, I read about reverse tolerance. Some people don’t get high on marijuana until they use it a few times,” Ketchum explains.

It wasn’t until he went on a paid, two-

year leave of absence from Edgewood that he started smoking pot socially. Ketchum had convinced the surgeon general of the Army that it would be in everyone's best interest if he studied neuroscience at Stanford University. How better to keep abreast of the latest advances in the field? In 1966, he joined a team of postdoctoral researchers mentored by Karl Pribram, a world-renowned expert on the brain and behavior.

Ketchum related well with his academic colleagues. "I got together with a few of my friends at Stanford and we had some cheap marijuana, which I smoked, and I got a real effect for the first time," he says. "I liked it. It was very sensuous. But I didn't use it very often. I didn't have any of my own."

Ketchum's West Coast hiatus coincided with the emergence of the hippie movement in San Francisco. "I was fascinated with this spectacular development," he gleams. "Luckily, I caught it at its peak."

Occasionally, Ketchum took his home movie camera to Haight-Ashbury, the epicenter of hippiedom, and filmed the procession of exotically dressed flower children strutting through the neighborhood high on marijuana and LSD. "I was always interested in drugs, primarily because I've always been interested in how the mind works," he says. "So when this wave of psychedelic users descended upon San Francisco, I thought maybe I'd learn more by going there."

Ketchum attended the legendary Be-In in Golden Gate Park in January 1967, sitting cross-legged on the lawn with 20,000 pot-smoking enthusiasts, soaking up the rays and listening to rock music, poetry and anti-war speeches. A few months later, the colonel began working as a vol-



When journalists briefly got wind of the Army's ambitious psychochemical warfare program, they scoffed at the notion of making the enemy lay down their arms by turning them on

unteer doctor at the Haight-Ashbury Free Clinic, where he treated troubled youth with substance abuse problems.

Life After Edgewood

Ketchum returned to Edgewood in 1968, but the mood back at headquarters was not the same as before. Growing opposition to the Vietnam War and public disapproval of the use of napalm and toxic defoliants cast a lengthening shadow over classified research into chemical weapons. When journalists briefly got wind of the Army's ambitious psychochemical warfare program, they scoffed at the notion of making the enemy lay down their arms by turning them on.

The colonel saw the writing on the wall. Army brass consented when he asked to be transferred to another base in the early 1970s. By this time, the Chemical Corps had concluded that marijuana-related compounds would not be effective in a battlefield situation, but the testing of other incapacitating agents under field conditions would proceed. And drug companies continued to supply a steady stream of pharmaceutical samples for evaluation by the military.

In 1976, Ketchum retired from the Army and embarked upon a new career as a civilian psychiatrist in California. Commissioned by the California Department of Justice, he collaborated on a 1981 study comparing the effects of alcohol and smoked marijuana on driving performance. The results were somewhat surprising. "When combined with alcohol, cannabis produced little additional impairment," he concluded.

"While alcohol had an adverse impact

on steering, THC affected a driver's ability to estimate time. But the combination of both drugs did not substantially increase the impairment produced by either one alone. ... In fact, there was an antagonistic effect. Marijuana seemed to offset some of the problems caused by alcohol, and vice versa."

Ketchum feels that drug prohibition is bad public policy. "It's the refusal to look at the evidence that keeps pot illegal. They misrepresented marijuana as an evil weed. ... I've always had a libertarian attitude toward drugs. I believe people should be able to do anything as long as it's not harmful to somebody else."

In the years ahead, Ketchum would reach out to medical marijuana trailblazers, prominent psychedelic advocates and drug-policy rebels working inside and outside the system to end prohibition. He joined the National Organization for the Reform of Marijuana Laws and became a member of the Multidisciplinary Association for Psychedelic Studies (MAPS).

Founded by Rick Doblin, MAPS has spearheaded the revival of scientific investigations into the therapeutic potential of LSD, ecstasy, psilocybin and ibogaine, while also challenging bureaucratic roadblocks that prevent independent cannabis research in the United States. Ketchum attended fundraising events and wrote letters to potential donors, praising the work of MAPS.

During the 1960s, Ketchum supervised thousands of drug experiments, yet he barely scratched the surface of the awesome potential of cannabis and LSD. "Jim is not apologetic for what he did before," Doblin says, "and I don't think he sees it as incongruous with supporting research into the therapeutic aspect of psychedelics.



One of the prime movers of Proposition 215, the successful med-pot ballot measure, Mikuriya quickly took a liking to the Ketchums and taught them how to use a vaporizer for inhaling cannabis fumes without tar and smoke

These tools have tremendous power, but he only looked at a narrow slice of it while he was at Edgewood."

Today, Ketchum steadfastly maintains that cannabis and LSD are safe drugs compared to many legal substances. This is what the Edgewood experiments and other studies have shown, he contends. Given his status as a retired army officer who had extensive, hands-on experience testing psychoactive compounds, he speaks with a certain authority that most medical and recreational drug users cannot claim.

Medical Marijuana

After Californians broke ranks from America's drug-war orthodoxy in 1996 and legalized medical marijuana in the Golden State, Ketchum got a recommendation from his family doctor to use cannabis for insomnia. "I have personally found it helpful, especially for sleep," he says. "I've had problems with sleep for a long time."

It was at a picnic hosted by the Shulgins that Jim and Judy Ketchum first met Tod Mikuriya, the controversial Berkeley-based physician who has been described as "the father of the medical marijuana movement." One of the prime movers of Proposition 215, the successful med-pot ballot measure, Mikuriya quickly took a liking to the Ketchums and taught them how to use a vaporizer for inhaling cannabis fumes without tar and smoke.

With Mikuriya tendering introductions, Ketchum befriended some of the leading lights of the '60s counterculture, including Tim Scully, the prodigious underground chemist who manufactured millions of hits of black market LSD (remember Orange

SYNTHETIC POT AS A MILITARY WEAPON

Sunshine?) while the colonel was administering hallucinogenic drugs to soldiers at Edgewood. “Jim and his wife visited me at my home in Mendocino County,” Scully says. “I enjoyed their company. We found that we shared idealistic beliefs about the potential for good in psychoactive drugs, as well as sharing some wry understanding of the pitfalls, too.”

As for their divergent paths in the past, Scully remarks, “I don’t really see his work as having been in conflict with mine. I believe Jim sincerely hoped to save lives by helping in the development of nonlethal



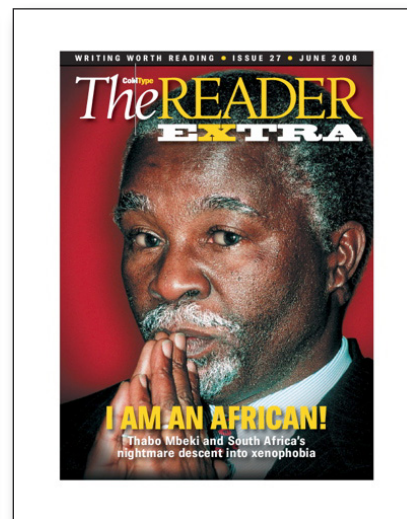
“I don’t have a problem with being difficult to categorize”

weapons as an alternative to conventional weapons.”

An incurable iconoclast, the colonel has made common cause with counterculture veterans and anti-prohibition activists. His endorsement of the therapeutic use of marijuana and LSD confers additional credibility on views long championed by his newfound allies. Validation, in this case, goes both ways. Embraced as one of the elders, a peculiar elder to be sure, Ketchum somehow fits right in.

“I don’t have a problem with being difficult to categorize,” he says. **CT**

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