

VOLUME ONE

The Nature of Drugs

History, Pharmacology, and Social Impact



ALEXANDER SHULGIN

Foreword by Mariavittoria Mangini

Praise for *The Nature of Drugs*

“Legendary chemist, nuanced psychonaut of molecular structure-activity relations, deep thinker on issues of societal policy, engaging storyteller, inspirational teacher, and all-around good human being—Sasha Shulgin takes us on an alchemical educational journey as if we were sitting there as students in the class from which this text arose. What a gift!”

— David E. Presti, Professor of Neurobiology, University of California, Berkeley
Author of *Foundational Concepts in Neuroscience: A Brain-Mind Odyssey*
and *Mind Beyond Brain*

“If you’re curious about any drug, from caffeine to LSD, this is the book for you. What an absolute treat to learn from the best, to have Professor Shulgin as your personal instructor, with all of his charming, self-effacing asides and his witty encyclopedic knowledge on display.”

— Julie Holland, MD
Author of *Good Chemistry: The Science of Connection from Soul to Psychedelics*
Editor of *Ecstasy the Complete Guide* and *The Pot Book*

“These course lessons are pure Sasha: enthusiastic, surprising, tangential, goofy, and shockingly knowledgeable. But they also give us something that remains terribly rare, even at this late date: a kaleidoscopic approach to the problems and possibilities of drugs that is at once pragmatic, visionary, and genuinely inter-disciplinary. Once again, Shulgin proves himself a magnificent spirit as well as a magnificent mind. I learned a lot, and enjoyed myself tremendously.”

— Erik Davis
Author of *High Weirdness: Drugs, Esoterica, and Visionary Experience in the 70s*

“The late, great Sasha Shulgin, a.k.a. “Dr. Ecstasy,” was a pioneering psychonaut who designed a dizzying array of psychoactive substances in his mad scientist laboratory hidden in the hills east of San Francisco. These meandering musings are the surviving record of a course he taught in the 1980s, the decade of “Just Say No.” They reveal the light-hearted human side of a chemist who—when it comes to drugs—advises us to ‘Just Say Know.’”

— Don Lattin
Author of the psychedelic trilogy: *The Harvard Psychedelic Club*, *Distilled Spirits*, and *Changing Our Minds*

“This book originated from a transcription of lectures given by Sasha Shulgin at San Francisco State University in 1987. In that respect, some of the content is dated. But for those who never had the opportunity to meet Sasha or hear him lecture, the transcriptions reflect Sasha’s vibrant lecturing style. Indeed, if you did know Sasha, you can almost hear him speaking in the words of this book. It is replete with the kinds of anecdotes and analogies that were characteristic of Sasha’s speaking style. He talks about what drugs are and their sources, different routes through which they enter the body, what they do in the body, how they leave the body, in addition to presenting information about various drug classes. Sasha sprinkles his lectures with questions about ethical and legal issues around drugs, and in general asks the reader to think deeply about some of the moral issues confronting us about drugs today.”

— David E. Nichols, PhD

Distinguished Professor Emeritus, Purdue University

“These transcriptions of lectures by Alexander Shulgin sparkle with the brilliance and wit of a pioneering researcher of the chemistry and effects of psychoactive drugs. Those fortunate to have known Sasha Shulgin will recognize his voice in these pages and take pleasure in listening to him share his wealth of knowledge and personal experience with magical molecules. A great read!”

— Andy Weil

Author of *From Chocolate to Morphine* and *The Natural Mind*

Director of Andrew Weil Center for Integrative Medicine at the University of Arizona

“Sasha was a beloved friend, a brilliant chemist, and an inspiration to everyone he met. This series of lectures captures the energy, warmth and irreverence that so typified his character. His underlying philosophy and approach to research remained forever youthful—a passion for knowledge; the need to constantly question established dogma, authority, and one’s own previous assumptions; the vital nature of individual freedom of choice; and the pursuit of knowledge for the sheer, child-like thrill of it. Though Sasha is with us no more, we are lucky to have the ever-radiant Ann, the Shulgin Farm, and this beautiful book, *The Nature of Drugs*, embodying his memory.”

— Amanda Feilding

Executive Director of the Beckley Foundation

“Dr. Alexander ‘Sasha’ Shulgin was a pioneer, giving us a pharmacopoeia of hundreds of compounds—many of which have not been thoroughly evaluated to this day. Yet, Sasha was far more than a chemist; Sasha was a philosopher, a mystic, and a gifted teacher. He was able to present the ‘boring’ subject matter of medicinal chemistry in a way that was compelling and fascinating. And he didn’t just teach chemistry; he placed the chemistry that he was teaching into the context of society, law, and history. Although Sasha taught widely and in many venues, nowhere is his teaching better represented than in the course he taught at San Francisco State University in 1987. Anyone with interests in science, chemistry, psychedelics, history, or philosophy, upon reading *The Nature of Drugs* will be rewarded with an incredibly fascinating and enriching experience.”

— Dennis McKenna

Editor of *Ethnopharmacologic Search for Psychoactive Drugs: 50 Years of Research*
Founder of The McKenna Academy of Natural Philosophy—
A 21st Century Mystery School

“Alexander Shulgin was many things, but first and foremost he was a teacher: he taught students, law enforcement, physicians, and eventually the world through the publication of his books PiHKAL and TiHKAL. This is Alexander Shulgin at his sharpest and most passionate. Emboldened by the emergency scheduling of MDMA and the passage of the Federal Analogue Act only three months previously, he offers a series of discursive lectures on medicine, pharmacology, human physiology, philosophy of science, astrology, alchemy, law, and linguistics. This text is a precious opportunity to attend a class taught by one of the great scientific thinkers of the 20th century and an indispensable primer for understanding the immensely complicated subject we call ‘drugs.’”

— Hamilton Morris

Documentarian and Chemist
Creator and Director of *Hamilton’s Pharmacopeia*

— The Nature of Drugs —

The Nature of Drugs

History, Pharmacology, and Social Impact



VOLUME ONE

ALEXANDER SHULGIN

FOREWORD BY Mariavittoria Mangini



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The Nature of Drugs has been an effort involving many people spanning some years. The overarching vision, input, and guidance came from Ann Shulgin and her daughter Wendy Tucker. Scott Bodarky digitized the tapes and worked to clean up the audio quality as well as the mountain of ephemera and media in the barn. Transcription was begun by Stacy Simone while she was working digitizing the wealth of photos. The transcription was taken over and completed through lecture 8 by Melitta Konrádi. Sylvia Thyssen helped to edit and create a readable text. It was proofed and corrected by Keeper Trout who additionally filled in missing elements by re-listening to the audio files and using Sasha's written notes. The flow is therefore not exactly the same as the transcribed content, but the words are Sasha's. The text was further proofed by Jon Singer, Wendy Tucker, and Robin Donovan.

PUBLISHER'S NOTE

This book is a time capsule.

When Sasha taught this class, computers were in use but most of his research was done through periodicals, journals, and books. He went to the library. You'll hear him referencing his favorite journals, and he will describe how to find the information desired, but of course this has changed a great deal since then. This is true too with the information he gives about patents and laws; it is not up to date.

We ask that you keep this in mind as you read this book, and to understand that regardless of these details, his advice and wisdom about *how to do research well* is still true. If Sasha were alive teaching this class today, he would probably tell people that they must be even more diligent than ever to weed through all of the misinformation there is on the internet. Research may be easier to do in some ways, but finding what is real and true takes more work, more skill, more objective and critical thinking, and is probably more difficult than before.

Enjoy this first volume of *The Nature of Drugs*!

— Wendy Tucker
Publisher, *Transform Press*
February 2021

FOREWORD

There are many aspects of Sasha Shulgin's life and work that will likely be familiar to readers of this book. His best-known works, *PiHKAL* and *TiHKAL*, written with Ann Shulgin, combine the stories of their courtship and marriage with chemical synthesis information from private notes on psychedelic compounds. Working in his lab, in a shed in the yard of the Shulgin Farm, his family home, Sasha independently created more than 200 psychoactive substances. Although his research papers describing the hundreds of unique chemical compounds that he synthesized have been widely published, and his work is of unquestioned importance, his research was not subsidized by a university, a government research facility or an industrial sponsor. Instead, he supported his work and maintained his independence from potentially censorious influences by consulting, lecturing and teaching. The Farm today is the repository of a treasure trove of research documents and reports, lectures, journals, letters, and photographs that comprise Sasha's scientific library and personal papers, which are now being explored and digitized. This book, which represents the transcripts of the first semester of a pharmacology class taught by Sasha in 1987, is a part of that effort.

In approaching the material presented in *The Nature of Drugs*, it is important to note that the social environment in which a contemporary reader encounters these lectures is significantly different from the one that prevailed when they were presented. In 1987, this country was in the midst of a moral panic about drug use. The use of plants and chemical compounds for the purpose of consciousness alteration was generally considered to be a criminal act. Although research indicated that many users of illegal psychoactive drugs were able to function effectively and undetectably in society, most public policy of that time presupposed that such use would inevitably have demonstrable negative consequences.

At the time that these lectures were presented, the popular and the legal formulations of the use of illegal drugs allowed, for the most part, for only two patterns: abstinence and abuse. Any illicit drug use was defined as abusive, and moderate use was believed to be an unstable pattern, which might at any time deteriorate into uncontrolled use or drug addiction. Studies of drug users often failed to differentiate between different patterns of use, employed imprecise and inaccurate terminology in describing levels of use, or made no attempt to describe patterns of moderate use. The majority of theories that explained drug use and described the drug user did so in such negative and pathological terms that it seemed mysterious that any drug users survived at all. Sasha was one of the minority of drug experts who recognized the existence of a large number of experimental or occasional users who did not present any serious problem in terms of morbidity and mortality. On the contrary, he understood that drug users might value their experiences for many different reasons that did not arise from pathology, and that most drug users do not become abusers or addicts.

Ironically, the existence of patterns of moderate use was most publicly recognized by William Bennett, “drug czar” of the first Bush administration, who acknowledged the possibility that experimental, infrequent, or even regular non-compulsive use of illicit drugs might have few detectable effects on the health, work, families or social lives of some users. Nevertheless, in Bennett’s 1989 National Drug Control Strategy, he singled out these “non-addicted casual users” for his strongest opprobrium, calling them “potential agents of infection for non-users,” presumably because they did not fit his description of drug users as “inattentive parents, bad neighbors, poor students, and unreliable employees” whom no one would wish to imitate.

With the ascendance of political conservatism during the Reagan administration, problems that might be associated with the use of prohibited drugs had come increasingly to be viewed as resulting from moral, spiritual or biological defects of individuals, rather than as the product larger of social or environmental problems. The remedy for these

dysfunctions was greater social control, as opposed to social welfare. Cultural conservatives determined that they could use drug prohibition as a legitimate source of control over unruly elements: minorities, youth, “aliens” and cultural liberals; the “dangerous classes” that seemed to be getting out of control in the 1960’s and 70’s.

Drug prohibition became a powerful exponent of the projects of the cultural right. It displaced concern for social conditions such as poverty, lack of educational opportunity, racism, unemployment, and a deteriorating social safety net; and concentrated explanation of them on the deficiencies and weaknesses of the affected individuals. For groups that were experienced by conservative elements in society as disorderly, rebellious, and disrespectful of authority, opposition to their non-conforming behaviors was seen as a reaffirmation of social hierarchies and traditional moral values. Control of the use of drugs that might be favored by these groups was used to provide the justification for increased social control and drug prohibition was linked with expressions of racial and ethnic intolerance.

Sasha challenged this prohibitionist stance both for its provincialism that specified a limited range of acceptable interests and experiences and for its paternalism that surrendered autonomous decision making in return for a promise of security and safety. He drew critical attention to the substitution of lies, distortions and fallacies for history and scientific evidence that was characteristic of legalistic views of drugs and drug use. By contrast, he offered potential drug users a singular position: learn the facts, then make an informed decision for yourself. Rather than trying to control citizens’ choices, or resorting to hyperbolic fear-mongering, he advocated a pragmatic alternative: scientific and realistically grounded education. This was drug education that was not directed solely at prevention of use, but which also provided those who chose to use with information that encouraged moderation, appreciated the legal consequences and social realities of drug use, and was based upon science.

Much of this first series of lectures is devoted to Sasha’s view of teaching and learning. He encouraged students to listen to the emerging

“music” that the interplay of his planned lecture outlines, inquiries and offerings from class members, and his own stream of thoughts produced; and he discouraged excessive notetaking as a distractor from the experience of in-person interaction with the class material. He wanted students to get the feel of his work as a chemist, but also as a philosopher and an artist. Drugs, he claimed, were incidental to his presentation of ideas about free choice and informed citizenship. They provided an occasion for Sasha to talk about what he claimed really went on in this class: an experience of learning that was designed to equip us to have freedom of choice and to retain our personal power of discernment in our decisions and actions. Sasha was an early endorser of “just say know” as an alternative to “just say no.”

Those of us who were fortunate to spend time in conversation with Sasha can almost hear his voice as we read these transcripts. He was an engaging teacher, masterful and authoritative about his subject, but ready to acknowledge ambiguities and areas that were outside his expertise. He was quick to grant that there were exceptions to his expert knowledge and that ten percent of his ideas would be likely disproven. His expressed wish in these classes was for the students to listen to the “music of chemistry,” which he saw as a creative exercise.

The incontestable principles of chemical structure served as a launching point for discussions about societal issues and controversies. In this series of lectures, which was intended for a general audience with no particular background in chemistry, Sasha prepared his listeners for the detailed discussions of specific drugs that would be presented in later classes. He covered basic anatomy and neuroanatomy, physiology and neurophysiology—our “plumbing and wiring” as he called them—pharmacological concepts such as pharmacokinetics and pharmacodynamics, definitions used to describe drugs and their effects, and a chronology of drug law and policy. By introducing the pharmacokinetic processes that explain the way that the body reacts to drugs and the pharmacodynamics of receptor effects and chemical interactions, Sasha opened a greater access to wide-ranging discussions of drug action for students who might

lack a background in these areas. More importantly, these lectures provided an opportunity for Sasha to present his opinions, convictions and principles in a context that attracted students with an interest in the role of psychoactive substances in human experience.

Sasha's teaching sometimes followed an outline or notes and sometimes, by his own admission, "just rambled around." In this lecture series, he laid the groundwork for further explorations that would come later, equipping his audience to participate with him in some wide-ranging conversations about individual drugs, what they do, and how we think and legislate about them. In order to do this, Sasha presented foundational knowledge that would permit his students to formulate pertinent questions and to follow him in his rambles. This background of understanding was meant to allow class time to be an interactive learning environment, where both students and instructor could engage creatively with the subject matter. Sasha used a broad definition of "drugs" which included "those things that influence a living organism or behavior," and he provided a picture of where drugs come from and where they go, their actions, their risks, and their virtues. This became the basis for his later lectures not only on specific drugs, but also on topics that relate to a "wilder territory" that embraces as drugs such things as smog, radioactivity and pesticides.

The importance of Sasha's digressions and asides can't be overestimated. He provides practical examples that illustrate important concepts in a way that is in keeping with his position about note taking—that it distracts from listening appreciatively to the material being presented. He uses his position as an experienced researcher to discourage attempts to "prove" a hypothesis, and to remind his students that science advances by discovering that previous hypotheses are incorrect. He emphasizes the importance of asking the appropriate research question, and of designing inquiry as a quest to disprove hypotheses, since an experiment that proves a hypothesis is impossible to devise. He also delves into areas of philosophy and policy, and gives invaluable advice about the nature and conduct of research. Sasha was acutely aware of

the way that powerful persons, governments, and agencies may be more committed to avoiding any admission of error than to moving from ignorance to enlightenment and that there must be places where the laws can be broken in order for society to test their merit.

Sasha's comparison of drug education to sex education gives a hint of the perspective that led him to describe his chemical diagrams as "dirty pictures." The idea of both is to equip the listener to make informed decisions when the opportunity and the inclination to engage in certain behaviors may coincide. He was not reticent about including his views about social ethics in his lectures, but he did not advocate for or against drug use. He refuted the conventional ideas about abuse of drugs that define "abuse" as use of any forbidden drug, lack of permission from a specific professional prescriber for use, acquisition of drugs through unsanctioned channels, or use of drugs in ways that may introduce an element of danger. Sasha held to a definition of drug abuse that has nothing to do with illegality or medical supervision: as long as drugs can be used in ways that don't interfere with social functioning or mental and physical health, their use is not here considered to be abuse. In this more complex view of what constitutes abuse, the relationship of an individual to a substance is the crucial concern.

In order to have a foundation for following Sasha's lectures, and to keep up with his observations, stories and replies to their individual inquiries, students were encouraged to use the class' textbook to gain a basic vocabulary and understanding of the various kinds and classes of psychoactive drugs. The textbook *From Chocolate to Morphine*, by Andrew Weil and Winifred Rosen, was first published in 1983, a few years before these lectures were presented. It is still in print almost 40 years later, and the ideas that made it an obvious choice for Sasha to select have come to enjoy greater acceptance: that the desire to alter consciousness is an innate, normal human drive, and that problems with drugs arise from poor relationships with drugs, not from the inherent characteristics of the drugs themselves.

At the present moment, Sasha's devotion to the presentation of truths backed up by scientific and historical evidence presents a refreshing contrast to the encroachments of the current war on science. He saw himself as a truth seeker, rather than an advocate for or against drug use, and his work is an example of a cognitive lust: an intense desire to learn and know everything that there is to know about a fascinating subject. In his case, the inspirations for this enthusiasm were drugs that could cause not only visual and sensory changes, but could also modify and influence brain function. His interest was in drugs that "turn the mind;" psychotropic substances that can cause changes in perception, attitude, or point of view, and sometimes expand one's mental and emotional horizons or provide access to one's interior universe.

Sasha could be persuaded to admit that he was an alchemist. He approached chemistry as a sacred art and was mindful of the way in which the practical and the philosophical, the esoteric and exoteric, intersected in his work, as they did in classical alchemy. Historically, only a few practitioners of the arts he practiced rediscover this ancient truth. He viewed alchemy as a form of meditation, and chemistry as an art that was exactly like the composition of music, or the creation a painting: the putting of things together that had never been together before.

Sasha's practice was informed by the realization that the essential alchemical work was to understand oneself. While he delighted in the practical work of the laboratory, he recognized that the transmutation that is sought in the alchemical quest is a spiritual regeneration of the practitioner, in an evolution from ignorance to enlightenment. He was grounded in the real and tangible but respectful and curious about the mystical and intangible. Sasha mused about the possibility of embedding one's character in the substances that one works with, in a way that could be recognized by others. Beyond earth, water, fire and air, the elements of which everything is made, he was curious, as were the classical alchemists, about the quintessence, the fifth element, the spirit in matter, the soul that puts all the rest into place. In his work, Sasha Shulgin was able

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to achieve one of the goals of classical alchemy: to manifest spiritual forces for transformation in a material form. This class was a vehicle that he used to expose his audience to the ideas that shaped his work, and which lent a quintessential character to the substances that he created and synthesized. For us who have had the benefit the transformative power of Sasha's discoveries and innovations, these lectures give a unique glimpse of his remarkable mind at work.

— Mariavittoria Mangini, PhD, FNP
Cofounder, Women's Visionary Council
December 2020