PSYCHEDELICS (version 2018.11.15)

- psychedelic = mind revealing (coined by Humphry Osmond, 1956; in correspondence with Aldous Huxley)
  - *psyche* = spirit / life breath / soul / mind
  - *deloun* = to show / make manifest / reveal
  - *delos* = visible, clear
- phanerothyme (proposed by Aldous Huxley, 1956) = *phaneros* (visible) and *thymos* (soul / mind)
- hallucinogens = producing hallucinations (perceptions in the absence of external stimuli)
  - *hallucinari* = to wander in the mind
  - *genesis* = bring into existence / creation / generate
- psychotomimetics = mimicking psychosis
- entheogen = generating god within

- plant and fungal psychedelics have a long history of spiritual / religious / shamanic / healing / therapeutic / ritual use by indigenous cultures

- **effects of psychedelics on the mind**
  - heightened awareness
    - external sensory input: visual, auditory, tactile
    - internal thoughts and feelings
    - increased emotional content to everything
  - alterations of sensory perception: motion, multiple visual images, distortions of perspective, hallucinations, synesthesia
  - dreamlike imagery and feelings
  - loosening of psychological defenses
    - unconsciousness material brought into awareness
    - beneficial for therapeutic work
    - anxiety and panic may occur
  - *pharmakon*

- effects of psychedelic drugs vary powerfully with differences in set and setting
- set: mental and physical state of the user: intentions, expectations, prior experience, personality, and current state of mind
- setting: environment in which use occurs
- effects are dose dependent
  - from mild perceptual distortions to profound emotionally-charged mystical experiences
- intention is the most important thing, as it determines everything else
- follow-up: integration, ongoing attention to impact and openings
- importance of the circle, broadly defined

- **LSD – lysergic acid diethylamide**

  - synthesized by Albert Hofmann (1906-2008), Sandoz Laboratories, Basel, Switzerland, 1938
  - re-synthesis and discovery of psychoactive properties by Hofmann in April 1943
  - landmark event in the history of neuroscience
  - derivative of an alkaloid (ergotamine) found in *Claviceps purpurea* (ergot), a fungus that grows on rye and other cereal grains
  - ergotamine is a vasoconstrictor
  - Hofmann was exploring derivatives for their vasoconstrictive properties for use in the treatment of headache, postpartum bleeding, stimulation of uterine muscle contractions for the induction of labor

- potent psychedelic psychoactivity
    - threshold dose ~ 10 micrograms (μg)
    - typical psychedelic dose ~ 50 to 300 μg
    - typical unit dose on the illicit market ~ 65 μg
    - duration ~ 10 hours
    - efficient oral and digestive-system absorption
    - packaging: blotter paper, pill or tablet, liquid, sugar cube, gelatin, etc.
    - historically, illicit LSD was quite pure, although there has been common folklore among both users and professionals that LSD is often contaminated with strychnine, PCP, methamphetamine, etc.

- Eleusian Mysteries of ancient Greece
    - infrequent (annual?, once-in-a-lifetime?) ritual offered to individuals in certain strata of society
    - possibly involved use of psychedelic plants or fungi
    - some say possibly ergot alkaloids from fungi on grain

- ergot fungi may contain various psychoactive alkaloids, such as lysergic acid amide, lysergic acid hydroxyethylamide, as well as other alkaloids some of which can be quite toxic
- outbreaks of ergot poisoning are believed to have happened throughout history
- associated with flour, bread, or beer made from ergot-infected grain

- **LSD history timeline**
    - 1938: first synthesis by Albert Hofmann at Sandoz Laboratories
    - April 1943: discovery of psychoactive effects by Albert Hofmann
    - 1950s: CIA and other US government agencies explore its use as a chemical weapon
    - 1950s-60s: clinical research in the treatment of addiction, psychosis, and other mental illness
    - late 1950s: information begins to reach the public, via government-sponsored research projects
    - early 1960s: Timothy Leary, Richard Alpert (later Ram Dass), and the Harvard group
    - early 1960s; Ken Kesey, Merry Pranksters, San Francisco Bay Area Acid Tests
    - 1960s: expanding "recreational" use
    - mid-late 1960s: adverse effects, exaggerated by media
    - mid-late 1960s: LSD (also other psychedelics, cannabis) associated with anti-war and other anti-establishment protest movements
    - mid-late 1960s: first laws against LSD in some states, including California (October 1966)
    - 1968: *The Electric Kool-Aid Acid Test* by Tom Wolfe
    - 1968: possession of LSD banned by US federal law
    - 1970: classified as a Schedule One substance by the US Controlled Substance Act
    - 1971: United Nations Convention makes LSD Schedule One internationally
    - 1970-71: clinical research halts
    - 2014: first controlled clinical study of LSD therapy in >40 years

- **LSA - lysergic acid amide**

- found in seeds of some species of morning glory
    - family *Convolvulaceae*
    - *Turbina corymbosa* (*Rivea corymbosa*), *Ipomoea violecea, Ipomoea tricolor* (?)
- note: sweet potato (*Ipomoea batatas*) is close cousin
- seeds called *ololiuqui* in Nahuatl language of the Aztecs, meaning "round thing"
- LSA chemically identified by Albert Hofmann ~ 1960
    - about 1/100 as potent as LSD

- morning glory seeds were used as ritual psychoactive agents by Aztecs and may still be used by some contemporary Mexican Indians (e.g., Mazatecs of Oaxaca)
- LSA and other ergot alkaloids also found in Hawaiian Baby Woodrose (*Argyreia nervosa*)
    - family *Convolvulaceae* (morning glory family)
    - native to India; no known history of ritual use of this plant

- **psilocybin and related molecules**

- psilocybin = 4-phosphoryloxy-N,N-dimethyltryptamine
- psilocin = 4-hydroxy-N,N-dimethyltryptamine
- found in numerous species of mushrooms which grow throughout the world
    - *Psilocybe cubensis*, *Psilocybe cyanescens*, *Psilocybe semilanceata,* etc.
- best documented history is of the native pre-Columbian peoples of Latin America
- *teonanacatl* - "sacred mushroom" or "flesh of god" in Nahuatl, the language of the Aztecs
- described in writings of the Spanish from the 1500s-1600s

- considered an evil idolatrous activity, akin to devil worship, denounced as heresy
- "They called these mushrooms teonanacatl in their language, which means 'flesh of god', or of the devil that they worshipped, and in this manner, with this bitter food, they received their cruel god in communion." - Friar Toribio de Benavente Motolinia (1541)
- Catholic Church persecuted the ritual use of mushrooms and other entheogenic substances
- practices became underground and secret; secrecy maintained for centuries
- by the early 1900s, it was believed by many ethnobotanists that the use of entheogenic mushrooms in Mexico may never have happened; perhaps a misattribution of peyote use
- 1930s: Richard Evans Schultes and others re-established the existence of entheogenic mushrooms
- 1938: Schultes traveled to Huautla de Jimenez to collect samples and identified several species
- 1950s: R. Gordon Wasson and Valentina Pavlovna Wasson investigated stories of entheogenic mushroom use among the Mazatec Indians of southern Mexico
- 1955: mushroom ritual with curandera Maria Sabina, documented in a major article with photographs in *Life* magazine (13 May 1957)
- brought knowledge of this heretofore secret ritual use into the world

- Wasson informed French mycologist Roger Heim of the mushrooms, who subsequently collaborated to identify many species
- Heim provided samples to pharmaceutical companies, colleagues, and eventually to Albert Hofmann for chemical analyses and hopeful identification of active component
- animal assays proved unrevealing and Hofmann tested the fractionated mushroom extracts on himself
- psilocybin and psilocin were identified by Albert Hofmann in 1958
- structures proven by total synthesis conducted by Hofmann

- psilocybin is more stable than psilocin in the mushroom; psilocin is prone to oxidation
- once ingested, psilocybin is rapidly metabolized (by hydrolysis of the phosphate group) to psilocin
- psychedelic psychoactivity
    - threshold dose ~ 1 mg; typical psychedelic dose ~ 10 - 50 mg
    - dry weight in mushrooms is ~ 1% = ~ 1 - 5 grams mushrooms
    - duration ~ 5+ hours
    - efficient oral and digestive-system absorption
- psilocybin and psilocin now known to occur in at least 89 species of mushroom

- other related alkaloids:
    - baeocystine and norbaeocystine
- baeocystine = 4-phosphoryloxy-N-methyltryptamine
- norbaeocystine = 4-phosphoryloxy-tryptamine
    - isolated from *Psilocybe baeocystis* in 1968; subsequently identified in many other species
    - possible psychedelic activity
- 4-hydroxy-N-methyltryptamine; 4-hydroxy-tryptamine

- **DMT - N,N-dimethyltryptamine**

- present in a large variety of plant species throughout the world
- long history of ritual use in Amazonia
- not orally active, because of efficient oxidation (producing non-psychoactive compounds) by the enzyme monoamine oxidase (MAO) in the digestive system
- must be taken in by a parenteral routes, bypassing the digestive system
- insufflation of a dry snuff made from plants containing DMT
    - *Anadenanthera peregrina* ~ cohoba and yopo snuffs from seeds
    - *Virola* ~ epena snuff from bark
- can be smoked or injected, but these are not traditional routes of administration
    - rapid onset; duration ~ 15-30 minutes

- Amazonian tribal peoples long ago discovered a way of preparing DMT that makes it orally active
- ayahuasca = "vine of the soul" = *Banisteriopsis caapi*
- ayahuasca brew (aka yagé):
    - ayahuasca vine (now known to contain MAOIs, harmine and harmaline)
    - plant containing DMT, such as *Psychotria viridis* or *Diplopterys cabrerana*
    - other plant admixtures sometimes present
    - duration ~ 4+ hours
    - traditional ayahuasca songs = icaros
- tribal ayahuasca use in Brazil has migrated into cities and syncretic spiritual practices (combining elements of Christianity, other indigenous religious practices, and ayahuasca) have been founded
- two major ones: Santo Daime and União do Vegetal (UDV)
- spiritual-religious use of ayahuasca in USA
    - 2006: US Supreme Court decision (04-1084) (US v. UDV)
    - 2009: Federal Court in Oregon, Santo Daime

- related compound: 5-methoxy-DMT ("jaguar" or "toad")
- found in a variety of plants
- also in secretions from certain desert toads (*Bufo*)
- active only via parenteral routes of administration because of MAO in digestive system
- contemporary, non-traditional modes of use: smoking or vaporization of dried *Bufo* secretion; smoking or insufflation of chemical 5-MeO-DMT

• **mescaline - 3,4,5-trimethoxyphenethylamine**

• found in several species of cacti of the Americas
  • peyote cactus = *Lophophora williamsii*
  • San Pedro cactus = *Echinopsis pachanoi* (formerly *Trichocereus pachanoi*)
  • closely related = *Echinopsis peruvianus* = Peruvian Torch cactus
• psychedelic psychoactivity
  • psychedelic dose ~ 300 - 500 mg of the sulphate salt; less of the chloride salt
  • 6 - 12 peyote "buttons"
  • duration ~ 6+ hours
• first psychedelic substance to be chemically identified from a plant
  • Arthur Heffter (1859-1925), from peyote, Germany, 1897
• peyote has a long history of spiritual use by native Americans from Mexico, and later North America
• Native American Church peyote ceremonial sacrament
• 1990: US Supreme Court: Employment Division, State of Oregon v. Al Smith
• 1993: US Congress: Religious Freedom Restoration Act
• 1994: US Congress: American Indian Religious Freedom Amendment
• 2004: Utah Supreme Court: peyote use permissible for non-Native American religious group

• **classical psychedelics = LSD, psilocybin, DMT, mescaline, etc.**

• **possible adverse effects of classical psychedelics (*pharmakon*)**

• physical toxicity is low, generally high therapeutic index (TI)
• dangerous behavior while intoxicated always a possibility
• reports of HPPD: Hallucinogen Persisting Perceptual Disorder
  • chronic visual disturbances possibly brought on by use of psychedelics
  • may be exacerbated by other intoxicants
• most common adverse effect: anxiety, panic, "bad trip"
• creation or exacerbation of long-term cognitive / emotional problems
  • anxiety, depression, mood instability, psychosis
• flashbacks: re-experiencing of altered state of consciousness in the absence of ingested drug
  • powerful memories, positive or negative
• psychedelics may have profound effects on "neuroplasticity" – dynamic rewiring of neural connections
  • conducive to robust learning and memory
• very powerful shamanic substances
• essential important of intention, and the circle

• **neurochemistry of the classical psychedelics**

• interact with brain serotonin (5-hydroxytryptamine = 5-HT) receptors
• agonist actions at 5-HT_{2A} receptors is most robust known effect
• different psychedelic chemicals have different kinds of 5-HT_{2A} receptor agonist activity
• 5-HT_{2A} receptors occur throughout the cerebral cortex, providing numerous sites for action

• LSD and other classical psychedelics enhance the firing of noradrenergic neurons in the locus coeruleus in response to sensory stimuli, possibly enhancing sensory input to the cortex
• LSD also binds to many other neurotransmitter receptors and reuptake transporters
• other classical psychedelics appear to be more selective for 5-HT_{2A} receptors

- tolerance develops with repeated use
- cross-tolerance exists among several psychedelics: LSD, psilocybin, mescaline
- in most cases, people do not use psychedelics often enough to develop significant tolerance
- no clinically significant withdrawal symptoms upon cessation of use
- different for classical psychedelics versus MDMA, MDA, etc., which may have amphetamine-like withdrawal, and are more prone to abuse
- abuse / dependence / addiction relationships with classical psychedelics are rare

- **ibogaine**

- root bark of the west African iboga plant: *Tabernanthe iboga*
- ritual use in Gabon, Africa
- chemical ibogaine isolated and identified from iboga in 1901
- classical psychedelic effects, perhaps mediated by $5HT_{2A}$ receptor agonism
- pharmacology: 5HTR agonist, SSRI, NMDA-GluR antagonist, mu-opioid agonist, kappa-opioid partial agonist
- major metabolite noribogaine is also pharmacologically active
- anti-addiction properties explored, especially for opioid addiction treatment
- ibogaine may have a higher risk of physical toxicity than other classical psychedelics
    - reports of cardiovascular stress, cardiac arrhythmia, death

- **MDMA: 3,4-methylenedioxymethamphetamine**

- aka: ecstasy, X, E, M, XTC, adam, molly
- substantially different from classical psychedelics
- a different category, limitation of terminology

- **MDMA history timeline**
    - 1912: synthesis by Merck chemical company in Germany
    - 1914: patented by Merck, no follow-up research
    - 1953: US Army studies MDMA toxicity in animals
    - 1965: MDMA synthesized by Alexander Shulgin
    - 1976: Shulgin publishes first scientific paper on the human effects of MDMA
    - 1970s-1980s: use by psychotherapists
    - early 1980s: recreational use and media attention; introduction of the name "ecstasy"
    - 1985: temporary placement in Schedule One by DEA
    - 1986: MAPS founded by Rick Doblin with goal of making MDMA therapeutically available
    - 1988: permanent placement in Schedule One
    - 1996: FDA-approved Phase I human clinical studies with MDMA
    - 2011: publication regarding the efficacy of MDMA-assisted psychotherapy for PTSD
    - 2017: MDMA for PTSD enters Phase III clinical testing; "break-through therapy" fast-tracking by FDA

- typical oral dose ~ 50 - 150 mg (1-2 mg/kg body weight)
- higher doses may be used by persons who have lost sensitivity
- duration ~ 4+ hours

- psychedelic-like: intensification of perceptions, thoughts, emotions
- however, substantially different from the effects of classical psychedelics
- perceptual distortion, cognitive disorganization, anxiety / panic are uncommon

- enhancement of feelings of intimacy and trust, decreased anxiety
- amphetamine-like euphoria and stimulant effects

- psychotherapeutic utility
- enhanced introspection and self-insight, intimacy, communication
- especially valuable in couples therapy, and in therapy for trauma
- use by therapists prior to controlled substance scheduling in 1985
- experiences produced by MDMA and other related substances are sufficiently different from classical psychedelics that new names for this class have been proposed in order to emphasize the distinction from the hallucinogens: empathogen (empathy enhancing), entactogen (touching within)

- possible negative effects of MDMA
    - jaw clenching, teeth grinding, sympathetic nervous system overstimulation
    - body temperature dysregulation, hyperthermia
    - negative effects may be exacerbated by physical setting
        - overheated environment, vigorous activity, dehydration
    - addiction / dependence like qualities
        - urge to use more drug as the effects wear off, and to repeat the experience
    - potentially lethal effects (rare)
        - cardiovascular stress
        - autonomic NS dysregulation, including malignant hyperthermia
    - potential post-trip negative effects, may last several days or more
        - fatigue, muscle aches, sleep disturbances, depressed mood

- many negative effects are associated with use of unknown substances sold as "ecstasy"

- reports of decreasing enjoyment with increasing use
    - loss of the special empathogenic qualities: "loss of the magic"
    - may occur after one use, or ten, or hundreds
- how to explain: tolerance versus issues of "neurotoxicity"?

- neurochemistry of MDMA
    - non-vesicular release of serotonin, dopamine, and norepinephrine from presynaptic axon terminals
        - non-vesicular release of monoamine neurotransmitter is via the reuptake transporter
        - serotonin is probably most robustly released by MDMA
    - in addition, has low affinity for many neurotransmitter receptors throughout the nervous system
- following high-dose MDMA administration in animals
    - decreased CNS serotonin, may persist for several months
    - decreased serotonin nerve terminal density in the cerebral cortex; partially regenerates after several months
- unclear whether there is a persistent effect on serotonin neurons at low/moderate doses
- "toxic" effects on serotonergic nerve terminals are blocked or reduced by:
    - selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine
    - antioxidants such as vitamin C, vitamin E, and alpha-lipoic acid
    - reduction in ambient temperature
- current hypotheses: entry of an oxidizing chemical species (possibly a dopamine metabolite) into serotonergic axon terminals via serotonin reuptake transporters
- serotonergic neurons may lack adequate antioxidant protection mechanisms, especially in comparison to dopaminergic neurons
- behavioral implications of these effects on serotonergic neurons are not known

- in recent years, pills sold as "ecstasy" have been found unreliable in content
- may contain psychoactive chemicals such as:
    - ephedrine, caffeine, amphetamine, methamphetamine, PMA (para-methoxy-amphetamine), methylphenidate, DXM (dextromethorphan), methylone, diphenhydramine, benzodiazepines, various other synthetic phenethylamines and tryptamines, etc.
    - or no psychoactives at all
- toxic reactions to "ecstasy" sometimes due to other substances represented as MDMA
- "molly" often touted as a purer form of MDMA, but this is not the case
- compilation of pill analyses data: www.ecstasydata.org (maintained by erowid)

- **MDA**
- 3,4 - methylenedioxyamphetamine
- similar in action and effects to MDMA
- reported as more stimulating and hallucinogenic than MDMA

- **ketamine**

- psychedelic-like effects of a very different nature; unique effects
- introduced into clinical medicine as "dissociative anesthetic" in mid-1960s
- chemical and behavioral similarity to PCP (phencyclidine), which it replaced as a dissociative anesthetic
- full anesthetic dose is completely dissociative and amnestic (≥1-2 mg/kg IV ~ 3-5 mg/kg IM)
- psychedelic dose ~ 0.5 mg/kg IM (higher oral or intranasal)
    - does not necessarily scale with body weight
- varieties of reported ketamine experience:
    - loss of body sensation, pure mind, dream reality more real than real, euphoric, nightmare, why would anyone choose to do this, addictive, humbling, etc. . . .
- recent exploration as a rapid-acting antidepressant (beginning with work at Yale and NIMH)
    - this clinical use has been with 0.5 mg/kg IV infusion over ~40 minutes
    - sub-psychedelic for most people
- ketamine, with appropriate dose and intention, being more appreciated as a variety of psychedelic therapy
- primary pharmacology: NMDA-glutamate receptor antagonist
    - also many other interactions
    - increased pharmaceutical-industry interest in glutamate-related pharmacotherapy for mood disorders

- **numerous synthetic phenethylamines and tryptamines** (many discovered by Alexander Shulgin)
    - phenethylamines: DOB, DOI; 2C-B, 2C-I, 2C-T-4, etc. in the 2C series; 2C-B-FLY, etc.
    - tryptamines: 5-MeO DiPT, diethyltryptamine, alpha-methyl tryptamine, 4-OH-MiPT, etc.

- **NBOMe series** (post-Shulgin, 21st century)
    - 25B-NBOMe (2C-B-NBOMe) = 2C-B-N-benzyl-ortho-methoxy
    - 25C-NBOMe (2C-C-NBOMe) = 2C-C-N-benzyl-ortho-methoxy
    - 25I-NBOMe (2C-I-NBOMe) = 2C-I-N-benzyl-ortho-methoxy
    - high potency: substantial effects at < 1 mg
    - long duration > 8 hours
    - can produce autonomic dysregulation and death
    - misrepresented as LSD on blotter paper, creating a dangerous scene

- **the perils of unknown powders and pills**

- **other substances having hallucinogenic and/or psychedelic-like psychoactivity**
    - nitrous oxide (N_2O) (laughing gas)
    - anticholinergics ("deliriants")
    - scopolamine and atropine
        - natural sources: *Datura*, *Brugmansia*, henbane, mandrake, etc.
        - muscarinic acetylcholine receptor (mAChR) antagonists
        - hallucinations, amnesia, delirium
    - nutmeg (from the seeds of *Myristica fragrans*)
    - *Salvia divinorum*
        - mint family, Oaxaca, Mexico
        - used by Mazatec curanderos / curanderas
        - psychedelic-like effects of a very different nature
        - salvinorin A - non-alkaloid primary psychoactive chemical
            - kappa-opioid receptor agonist
    - cannabinoids, *Cannabis*
    - synthetic cannabinoid-receptor agonists
        - another problematic scenario

- **psychedelics and psychotherapy (classical psychedelics and MDMA)**

- shamanic / therapeutic use of psychedelic plants and fungi for millennia

- psychedelics reduce or weaken psychological defenses
- defense mechanisms: protect the individual from experiencing anxiety, interpersonal and existential
- facilitate a deepening of introspection
- therapeutic guidance important, as undue anxiety may make the experience problematic

- psilocybin and LSD were extensively researched as psychotherapeutic adjuncts during the 1950s-1960s
- psychotherapy very promising in the treatment of alcoholism and in work with the dying
    - Stansilav Grof and colleagues at Maryland Psychiatric Research Center were leading researchers
- innovative investigation by Timothy Leary and collaborators at Harvard
    - psychedelics and mystical experience (psilocybin and the "Good Friday" experiment)
    - psychedelics and the rehabilitation of prisoners (psilocybin and the "Concord Prison" experiment)

- human clinical research was halted circa 1970, and has recently resumed
- human research projects conducted during the 1990s-2000s:
- dimethyltryptamine (DMT)
    - University of New Mexico, published 1994
    - first approved human research with psychedelics to be conducted since 1970
- psilocybin – mystical experiences – Johns Hopkins Medical School
- first published 2006, ongoing 2018 (including interaction with meditation practice; religious leaders)
- psilocybin – smoking cessation – Johns Hopkins
    - first published 2014, follow-up assessment and publication 2017
- psilocybin - obsessive-compulsive disorder - University of Arizona School of Medicine (2006)
- psilocybin - treatment of terminally ill - UCLA School of Medicine
    - published 2010; two large FDA-Phase II trials published 2016
- ongoing human clinical studies, 2018: NYU Johns Hopkins, UK

- FDA approved as "breakthrough therapy" for treatment-resistant depression, 2018
- psilocybin, LSD: functional brain activity – Imperial College, London UK
    - published 2012 to date, and ongoing
- psilocybin - treatment alcohol addiction: NYU and UNM – underway, 2018
- MDMA - post-traumatic stress disorder (PTSD)
    - first published 2010, ongoing 2018, FDA-approval for Phase III clinical trials
- MDMA for autistic spectrum disorder – published and ongoing at UCLA, 2018
- MDMA for anxiety related to life-threatening illness – completed and in preparation for publication
- ayahuasca and addiction treatment
    - published 2013 (Canada), ongoing (Takiwasi, Peru and elsewhere)
- LSD for anxiety in life-threatening illness
    - Switzerland, published 2015
- ibogaine – treatment of addiction (University of Miami and elsewhere, ongoing)
- MDMA – psychotherapy with cancer patients (proposed)
- LSD and psilocybin – therapy for cluster and migraine headaches (proposed)
- University of Zurich, Switzerland: multiple ongoing studies with psilocybin, MDMA, etc.
- Imperial College London: ongoing study of the neuroscience of psilocybin, LSD, etc.

- contemporary research entirely supported by private funding: Multidisciplinary Association for Psychedelic Studies, Heffter Research Institute, Council on Spiritual Practices, and Beckley Foundation.
- because of the impressive quality and positive outcomes of recent research, government funding from NIH (National Institutes of Health) and Department of Veterans Affairs will hopefully come in the near future; some government funding already for psilocybin project in UK.

- **important organizations and their websites (sources of current and reliable information)**

- Erowid Information Vaults: www.erowid.org
- Multidisciplinary Association for Psychedelic Studies: www.maps.org
- Heffter Research Institute: www.heffter.org
- Council on Spiritual Practices: www.csp.org
- Beckley Foundation: Consciousness and Drug Policy Research: www.beckleyfoundation.org

• **a few good books**

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