

Current Comments®

EUGENE GARFIELD

INSTITUTE FOR SCIENTIFIC INFORMATION®
3501 MARKET ST., PHILADELPHIA, PA 19104

The Drugs-Religion Connection. Anthony Michaelis Argues for the Development of an "Ideal" Drug

Number 50

December 10, 1990

As readers of *Current Contents*® (CC®) will be aware, I have long held an interest in the connection between religion and drugs. This interest was reinforced some years back when I was introduced to the art of the Huichol Indians, a community of some 10,000 to 12,000 people scattered among the southern mountains of Mexico's Sierra Madre range.¹

Huichol art, which is primarily expressed in the form of yarn paintings, gets its inspiration from yearly pilgrimages to a desert area known as Wirikuta, the Huichols' spiritual land of origin.^{2,3} During the pilgrimages there is a ceremonial search for peyote—a cactus containing the powerful hallucinogen mescaline. The peyote is eaten during special fiesta rituals, when Huichols believe they commune directly with their gods.

The ideas and motifs found in Huichol yarn paintings are often derived from visions acquired under the influence of peyote. On the back of every Huichol painting, the artist writes his or her mystical interpretation of the image. Visitors to ISI's headquarters in Philadelphia have seen our large collection of Huichol art and the many murals that adorn the walls of the building.

The question of using peyote in religious rituals reached the US Supreme Court earlier this year. The Court ruled six-to-three that states can prohibit American Indians from using peyote in their religious rituals without violating their right to free exercise of religion. Four justices in the case of *Oregon v. Smith*—three dissenters and Sandra Day O'Connor in a minority opinion—said the majority approach "dramatically departs

from well-settled jurisprudence...and is incompatible with our nation's fundamental commitment to individual religious liberty."⁴

In the essay that follows, my longtime friend, Anthony R. Michaelis, editor and founder of *Interdisciplinary Science Reviews*, London, UK, gives a historic overview of the use of drugs for ritual and religious purposes from Plato's time to the present.⁵ A chemist by training and an experienced journalist/editor, Michaelis offers a novel solution to the worldwide drug problem. He argues that the war on drugs could be greatly diminished by producing a legal, "ideal" drug.

This ideal drug, according to Michaelis, should induce euphoria, be pleasantly hallucinogenic, alter one's state of consciousness, and not lead to addiction or other undesirable aftereffects of presently available natural and synthetic narcotics. While assuming that no research is presently in progress on such a drug, he urges that research be begun at once on such a product.

This is certainly a controversial idea, given the present antidrug climate in the US and elsewhere, but one that deserves consideration. Certainly there have been arguments put forth over the years to legalize the use of some drugs as one way of combating criminal trade in hard (such as heroin), soft (marijuana), and synthetic (methamphetamine) drugs.

While the medical use of hard drugs such as morphine to relieve pain or soft drugs such as marijuana to treat glaucoma or reduce the nausea caused by chemotherapy is generally accepted, it is the recreational use

of drugs, including alcohol,⁶ that is the problem. Many believe this issue cannot be solved by prohibition or prosecution.

Michaelis, who earned his PhD at Imperial College, London, is essentially advancing an idea proposed almost 15 years ago by Matthew Huxley, the son of Aldous Huxley who wrote *The Doors of Perception*, which described the "mystical" effects of taking mescaline.⁷ The proposal, which called for a socially sanctionable drug and laid down the criteria for such a product, was first floated by Matthew Huxley in *Interdisciplinary Science Reviews*.⁸

It is interesting to note that Anthony has amassed his own extensive collection of artworks—medals issued to commemorate prominent scientists and scholars. I've enjoyed viewing this unusual collection when visiting him in London. Perhaps he may be persuaded to share his interest in scientific medals with *CC* readers in a future essay.

My thanks to Paul R. Ryan and Judith Schaeffer for their help in the preparation of this essay.

©1990 ISI

REFERENCES

1. **Garfield E.** The psychedelic art of the Huichol Indians. *Current Contents* (52):5-7, 24-31 December 1979. (Reprinted in: *Essays of an information scientist*. Philadelphia: ISI Press, 1981. Vol. 4. p. 348-50.)
2. -----, Huichol mythology and culture. Parts 1 & 2. *Current Contents* (28):5-11, 13 July 1981; (29):5-11, 20 July 1981. (Reprinted in: *Ibid.*, 1983. Vol. 5. p. 164-77.)
3. -----, Huichol art at ISI: "Pilgrimage to Wirikuta" by Ermeteria Rios Martinez and "Niños huicholes" by Lark Lucas. *Current Contents* (22):3-8, 2 June 1986. (Reprinted in: *Ibid.*, 1988. Vol. 9. p. 176-81.)
4. **Marcus R.** Court: states can ban peyote in rites: religious freedom does not justify breaking valid law, Scalia says. *Washington Post* 18 April 1990. p. A5.
5. **Michaelis A R.** Drugs—religion's chemical surrogates. *Interdisciplin. Sci. Rev.* 15(2):97-104, June 1990.
6. **Garfield E.** Alcohol: are the benefits worth the risks? *Current Contents* (15):5-13, 13 April 1981. (Reprinted in: *Op. cit.*, 1983. Vol. 5. p. 75-83.)
7. **Huxley A.** *The doors of perception*. New York: Harper, 1954. 79 p.
8. **Huxley M.** Criteria for a socially sanctionable drug. *Interdisciplin. Sci. Rev.* 1:176-82, 1976.

Drugs—Religion's Chemical Surrogates

DR. ANTHONY R. MICHAELIS, EDITOR

Interdisciplinary Science Reviews
12 Hall Road, London NW8, England

'Ice' (methamphetamine), 'crack' (smokable cocaine) and 'angel dust' (PCP phencyclidine) are designer drugs, synthesised to better and replace natural narcotic drugs; they follow the now well-established trend to improve natural products by man-made materials. At present these new drugs are only made in kilogram quantities by rogue chemists in illegal, back-street 'laboratories'; they cannot yet rival the tonne quantities of natural narcotics, like heroin and cocaine, derived from agriculturally cultivated plants, refined and marketed worldwide by sophisticated criminal cartels. Like so many other natural products, how-

ever—paints, textiles and rubber—these may well be replaced in time by synthetic drugs of which an infinite variety can exist. The most brilliant of all drug designers was finally caught in the United States after a very long search by federal agents. No doubt others will replace him, chemically copying, adding to and changing the drug molecule.

Socially Sanctionable Drug

With the ever-increasing worldwide seriousness of the drug problem, the time has come for a

Reprinted with permission from: *Interdisciplinary Science Reviews* 15(2):97-104, 1990.

radical solution, namely the production of a 'socially sanctionable drug' to be produced by the established pharmaceutical industry. Such a drug would induce euphoria, would be pleasantly hallucinogenic, gently altering the state of consciousness, without leading to addiction and the other highly undesirable after-effects of presently available natural and synthetic narcotics. Such an ideal drug, 'Soma', was first proposed in 1932 by Aldous Huxley¹ in *Brave New World*; J. D. Bernal² repeated the plea for such a 'non-habit forming drug for different enjoyments' in *The Social Function of Science*, 1939; and Matthew Huxley,³ the son of Aldous, fully elaborated in his article in *Interdisciplinary Science Reviews* in 1976 the 'Criteria for a Socially Sanctionable Drug'. Although 14 years have now elapsed since its publication, no research on this subject has apparently taken place, and a solemn entreaty must here be made to begin now with research on, and production of, the ideal drug.

The Drug Problem

During the past few years, the ever-increasing abuse of hallucinogens, the soft drugs, and of narcotics, the hard drugs, both of natural origin, has proved to be quite beyond any control: Today the drug problem is worldwide, has spread through all strata of society and neither Draconian laws, such as execution for smuggling, nor soft television advertising warning of the dangers of addiction, has had more than a minimal effect. According to the latest United Nations statistics



The cocaine hourglass.

Copyright, 1990, Los Angeles Times. Reprinted by permission.
The Cocaine Hourglass by Paul Conrad.

drug-related crimes are increasing faster than all other criminal activities. The occasional and much-publicised seizures of tonne quantities of narcotics by police and customs officials are known to be only a minute proportion of the illegal traffic that crosses all frontiers. It has been stated⁴ that in some countries such seizures are the 'bribes' paid to officials to let the bulk shipments pass unhindered.

The Extent of the Problem

It has been estimated that the total amount of marijuana available for use in the United States in 1988 was between 15,000 and 21,000 tonnes, of which 651 tonnes were seized in that year. With respect to cocaine, a similar picture emerged: of the total global production of 400 tonnes, 34 tonnes were recently confiscated in Los Angeles, Texas and the Gulf of Mexico, only 8% of the total. Estimates of the dollar value of the illicit drug market worldwide vary between \$300 and \$500 thousand million per annum. That drug addicts turn to crime to support their habit is well known, with the result that one-quarter of the murders reported in US cities are related to drug trafficking, and by September 1989, the US federal prison population was 53% above capacity. It is estimated that the US annual expenditure on illegal drugs is in the range of \$200 thousand million; for comparison, in 1988 Americans spent \$37 thousand million on tobacco, \$62 thousand million on alcohol, \$101 thousand million on new automobiles and \$497 thousand million on food, according to the US Commerce Department. There can be no doubt of the seriousness of the drug problem.

Possible Remedies

Why have natural drug production and consumption grown to such an almost unbelievable extent when, since Neolithic times, hallucinogenic chemicals from psychotropic plants have been widely used in all cultures and societies which have left us their records to study? What possible measures exist, apart from legal prohibition of drug use and public education of the user, to overcome the problem and its quite incalculable human suffering? The answer favoured at present is the eradication of drug production at its site by offering the peasant producers alternative crops to cultivate; as the economic return from such substitute crops is only a fraction of the price paid for coca leaves, opium poppies or Indian hemp, this solution to the problem has not succeeded. It has

been estimated that coca cultivation supports 3% of Peru's population and 5% of Bolivia's, and that peasants can earn 10 to 20 times as much from a coca crop as from the best legitimate alternative agricultural harvest. The drug economy has brought to these previously almost destitute people the first glimmer of hope of emerging from utter poverty. If the chain between grower, producer, distributor and consumer could be broken, would the growers again be thrown into distress and grinding poverty? To subsidise the growers to an adequate level of existence, once they had given up the cultivation of coca, opium and hemp worldwide, would require sums far in excess of those now devoted to the drug war by the United States and other countries. Coordinated international efforts at penetration, subversion and destruction of the drug cartels might appear a feasible solution, but so far they have failed utterly. Admittedly, some of the leaders of the Medellin drug cartels and their acolytes have been captured and a few imprisoned; but new ones are always waiting to take their profitable places. The only real remedy is to tackle the problem at the consumer end, either by removing the reasons for drug taking or by substituting a synthetic model drug, free from all harmful effects. Research into its synthesis and commercial production must now be started in all seriousness, before the drug problem becomes an even greater universal tragedy.

Consumer Growth

The recent growth of the drug problem can be blamed on two age-old human desires, greatly exacerbated by present conditions all over the world: the desire of the young to escape from an unhappy environment and the greed of the drug cartels in their criminal efforts. It has been estimated that a 300-kg shipment of cocaine worth \$900,000 in Colombia would have a retail value of \$27 million; according to *The Economist*, 'Cocaine is the most profitable article of trade in the world.' There are many forms of drug taking, such as the glue sniffing of the young, in search of a mystical experience—the kick—which religion is obviously no longer able to provide. Even worse is the smoking of opium, with a history of hundreds of years, to which smoking of crack (modified cocaine) has recently been added. Subcutaneous injection—skin popping—and, finally, intravenous injection of the drug—mainlining—are the most dangerous ways of drug taking by addicts. It is the classic story of repeating with ever-increasing dosages his or her quest for the

ultimate change of consciousness. In the rich North, the deterioration of the inner cities, unemployment and racial tensions between minorities have forced many to try alcohol and drugs to escape the environment. For the more affluent, drugs may have simply been a new extension to conventional pleasures or a way of escaping boredom. In the poor South, the population explosion and its attendant miseries have brought about further grim hardships in addition to the same societal factors prevailing in the North.

Producer Growth

As the markets for both soft and hard natural drugs developed, the producers, driven by their desire for easy riches and by their criminal greed, were not slow to exploit and expand the market with its incommensurate increase in profits. The value of drugs produced worldwide for the United States market⁵ is now estimated at anywhere from \$8 thousand to \$300 thousand million a year and is growing. No drug statistics are either accurate or up to date. Natural drugs are still derived from psychotropic plants like hemp, *Cannabis sativa* L., commonly known also as marijuana, hashish, ganja and kif; from the poppy plant, *Papaver somniferum*, yielding opium and its derivatives morphine, heroin and codeine; and particularly from the coca plant, *Erythroxylum coca*, the source of cocaine and its semi-synthetic derivative crack.

Drug Agriculture

Cultivation of these major drug sources is concentrated in the poor agricultural areas of Iran, Afghanistan and Pakistan, the so-called Golden Crescent, with India and Nepal as lesser but not unimportant producers. The second major area, the Golden Triangle, comprises Burma, Laos and Thailand, and the third, which one may well call the Golden Star, is in South America, in Colombia, Peru, Bolivia and Ecuador. The extent of drug agriculture may be judged from the fact that 215,000 tonnes of coca leaves are annually extracted in Colombia alone and refined there for cocaine. As mentioned before, all attempts to replace these immensely profitable crops with others have been a failure. Drug agriculture has become by far the most profitable source of export and the largest source of hard currencies for these countries; with their often very large external debts, governments have tolerated, if not actively encouraged, drug agriculture.

Consequences of Drug Agriculture

Like all other branches of agriculture, drug agriculture makes its considerable, though in this case hidden and illegal, contribution to the world's economics. Being illegal, its profits have allowed the illegal purchase of armaments on a large scale by either governments or by rebels, thus allowing regional conflicts to flourish and to continue for lengthy periods. So, for example, it is a fact that the Mujahadin of Afghanistan⁶ finance roughly one-third of their supply of rockets and ammunition from drug agriculture. Another instance is Lebanon, which produces roughly 60 tonnes of opium annually in the much fought-over Bekaa Valley, no doubt yielding profit for the arms trade.

Drug Laws and Drug Control

The production, sale and marketing of narcotic drugs has been declared a criminal activity in almost all countries. Legal controls of international narcotic traffic have now been attempted for more than 100 years but have been flouted worldwide. An early example of this was the first Opium War (1839-1842) which ended with the victory of the British over the Chinese and the Treaty of Tientsin, which allowed the unlimited importation of opium from India to China.⁷ Since then a long and complex history of international attempts to control drugs has evolved from the 1912 Hague Convention through League of Nations Agreements and the Narcotic Drug Conventions of the United Nations. None of these were effective. In addition to these international attempts many countries have passed their own legislation, like Narcotic Drug Control Acts and Dangerous Drugs Acts; but none of these laws have ever halted the illegal traffic and use of narcotic drugs. However, the inclusion of the phrase 'intent to distribute' has proved most useful in a recent US law to prosecute criminals when caught, but in the absence of any reliable statistics, the efficacy of drug legislation cannot be accurately determined. Yet the drug problem, with all its miserable ramifications, is on the increase.

Control of Synthetic Drugs

The recently developed synthetic drugs have presented a further difficulty to the lawmakers. It is normal practice to attach a schedule of prohibited drugs to all drug-control laws, the schedule spelling out the chemical formula, as well as the international and other non-proprietary name, of each prohibited drug, the last item being a cover-all

phrase like 'salts and preparations of the above'. As some of the synthetic drugs are not normally listed in prohibited drugs schedules, new schedules will now have to be drawn up under a title such as 'Controlled Substances Analogues'; then producers and users of the synthetic drugs can be prosecuted in due course, in years to come. As Goethe⁸ wrote in *Faust*:

Vom Rechte, das mit uns geboren ist,
Von dem ist leider! nie die Frage.

Chemical Interdiction

In the production of all drugs, in the refinement of the natural products just as much as in the synthesis of designer drugs, a range of chemicals is required in addition to the active principle itself. If the new synthetic drugs cannot be stopped by legal means, would the interdiction of chemicals be possible? Dr. John Emsley of Kings College, London University (*The Independent*, London, 5 February 1990) certainly made a persuasive case which appears theoretically feasible. To refine heroin from opium and cocaine from coca leaves, solvent-extractants such as acetic anhydride, methyl ethyl ketone and diethyl ketone are needed. Apparently the US Drug Enforcement Agency hopes that through control of these chemicals, the flow of cocaine from Colombia to the United States can be reduced, if not halted. In practice it may prove difficult, however, to prevent the supply of solvents from other countries, as well as control delivery from front companies using them for allegedly legitimate purposes. The same is true for the synthesis of designer drugs. Intermediate or precursor chemicals like ephedrine or phenylacetone may now be controlled, but they can probably be acquired illegally either from abroad under a false name or through front companies. Total control of the US or foreign chemical industry is out of the question, as was so recently proved by the synthesis of chemical-warfare agents in the Third World from imported intermediate chemicals.

Stop Prohibition?

It has been forcibly argued that as the drug problem is insoluble by legal, educational or any other means, the prohibition of drug usage should stop. At least such a soft drug as marijuana, or cannabis, should be easily available, as it is, for example, in The Netherlands and India. This argument gains some strength from the fact that the unavailability of these soft drugs drives the potential user into the arms of the criminal purveyor of hard

drugs, only too eager to market his wares. The argument fails to convince me, as it will prove impossible to legalise one kind of drug but not another. Supporters of the argument point to the precedent of alcohol prohibition in the United States and its eventual repeal in 1933 after it had created much criminal activity, bootlegging, and as its enforcement had greatly varied from state to state. One entirely novel societal phenomenon has entered this argument recently. If smoking can be almost eliminated by a virtual ostracism of the smoker, would not even greater pressures stop drug taking, if and when drugs become legally obtainable? At present, strong political, legal and public opinions will demand continuation of prohibition for the foreseeable future.

Ritual and Religious Use of Drugs

Undoubtedly the best control of drug usage occurred in historical times when drugs were widely used for ritual and religious purposes. The hallucinogens, the non-addictive chemicals from plants, producing a temporary altered state of mind, were then used as a means to an end, for example, to achieve union with tribal ancestors, to provide access for a shaman to his god, to expel evil spirits from someone possessed or to enable a medicine man to seek aid in the healing of the afflicted. Such usage is in sharp contrast to present-day practice, when drug taking is an end in itself, often an act of rejection of societal values, a protest against culture, society and its taboos. It is also a rejection of the long history of sanctioned and controlled drug use to achieve recognised cultural objectives.

History of Drug Use: Old World

It is, of course, quite impossible to review here the whole history of drug usage in the many different ancient and even modern societies which employed and enjoyed it; Furst⁹ edited an excellent summary of the subject in 1972. It ranged widely, from the *Amanita muscaria*, the divine mushroom or fly agaric, which R. Gordon Wasson brilliantly deduced to be the sacrosanct soma described in the *Rig Veda*, the text of Vedic Brahmanic ritual of about 1000 BC, to the *Club des Haschischiens*. This extraordinary club was founded in Paris in 1844; it met monthly at the Hotel Pinodan on the Isle St. Louis. Here, members ceremoniously, almost religiously, drank a green paste of hashish; this was followed by an elaborate banquet at the end of which hallucina-

tions occurred. This ritualistic feast was described by Baudelaire. Cannabis is mentioned in an ancient Chinese herbal of the second millennium BC, the Greeks inhaled the vapours from incense burners containing cannabis, and Democritus (ca 460 BC) knew cannabis in a drink with wine and myrrh to produce delirium and hallucinations—ambrosia? Plato's visions and the Eleusinian mysteries are also considered to be due to hallucinogens. All these drug usages were strictly controlled, very limited, and produced no addiction, as hallucinogens are not habit-forming.

History of Drug Use: New World

Whereas in the Eastern Hemisphere—the Old World—cultural development was rapid, from hunting to agriculture, through feudal to urban societies, in the New World American Indians retained their union with the natural and supernatural environment as a hunting people, with their shamans and medicine men using hallucinogens. Psychotropic fungi were in use in 1000 BC and in the Nahuatl language of the pre-Columbian period the ritual ingestion of hallucinogenic mushrooms was called *teonanacatl* or 'gods' flesh', the title of Furst's review. The sacred morning glory *Sophora secundiflora* and the peyote cactus were painted on many pottery vessels and used in that period in the funerary art of western Mexico. The widespread mushroom cult was to the Spanish missionaries the greatest hindrance to conversion to Christianity and they fought it fiercely; the Inquisition considered it as satanic trickery and even equated it with cannibalism. Equally loathsome to them was the peyote cactus, *Lophophora williamsii*; its cult survived, spread to Texas by 1760 and to the North American Indians by 1880. In 1930 the cult became the Native American Church, a legal religious sect, with about a quarter million Indian members. They consider its supernatural medicinal properties as a vegetal incarnation of the deity. Again, these drug uses were ritually controlled, limited and did not lead to addiction.

Narcotics in Literature

The transition from the ritualistic controlled use of hallucinogens to the personal, unlimited abuse of narcotics occurred over centuries and took different paths. Opium, the dried milky exudate of unripe seed pods of the poppy plant, was known to the Assyrians and Sumerians; Hippocrates prescribed it; Galen (AD 130-200) was enthusiastic about it; and Paracelsus (1493-1541) introduced

laudanum, an alcoholic solution of opium. The analgesic effects of opium have relieved the pain of millions, but also led to addiction. During the American Civil War, 40,000 soldiers fell victim to this affliction, due to the invention of the syringe and hypodermic needle. They were not alone. Thomas de Quincy (1785-1859) published in 1821 his famous *Confessions of an English Opium Eater*, conceived as a warning that arose from his innocent use of opium to relieve the pain of facial neuralgia; however, he did not always 'eat' it—de Quincy had a decanter of laudanum by his elbow while writing his books. As members of the medical profession always had free access to analgesics, their temptation for self-administration must have been great, and one must speculate whether Sir Arthur Conan Doyle (1859-1930), himself a qualified medical practitioner, occasionally succumbed. Why otherwise was his most famous character, Sherlock Holmes, a 'self-poisoner by cocaine' ('The Five Orange Pips') by injection, and why are Conan Doyle's descriptions of opium addiction in a London opium den so realistic ('The Man with the Twisted Lip')? There are other literary works written under the influence of drugs, but only one further author can here be mentioned.

Aldous Huxley

The grandson of Thomas Henry Huxley, Aldous Huxley (1894-1963) took a first in English at Balliol College, Oxford, in 1916, despite a condition of near-blindness which had developed while he was at Eton. His first novel, *Crome Yellow*, established his reputation in 1921 while he was living in Italy. In the 1930s he moved to Sanary, near Toulon, where he wrote *Brave New World*, published in 1932. Hoping that the climate of California would improve his eyesight, he left Europe in 1937, and while in California he became convinced of the value of mystical experiences, aided by experiments with hallucinogens like mescaline. He described the effects in *The Doors of Perception* and in *Heaven and Hell*. In his last novel, *Island*, he elaborated his vision of Utopia, mankind at its sanest and most admirable, where the youth of the island Pala underwent an initiation rite in which the moksha-medicine, a mild hallucinogen, played a vital part. As Huxley was the first contemporary author to discuss the relationship between mysticism and drugs, one must ask if these and similar books influenced or even promoted the drug-taking habits of his readers. It is certainly a fact that religious establishments ob-

jected. Institutionalised religions are not interested in the mystical or religious experiences of individuals.

Conclusions for the Pharmaceutical Industry

We have seen that hallucinogens have played an important, well-regulated and harmless part in ritual and religious practice for centuries. Narcotic drugs when used as analgesics have proved of immense benefit, but have brought great human misery and led to criminal activities when used by drug addicts. So far at least it has been impossible to arrest enough criminals to stop drug abuse on either a national or international scale. The only scientific solution to the drug problem, proposed by Matthew Huxley 14 years ago in this Journal, has not been taken up by the pharmaceutical industry, although large profits could have been made and although massive taxation would have benefited any state which licensed such an 'ideal drug'. I must attempt to answer why this has not been done, however tentatively I can do this. The safeguarding and improving of public health is the avowed aim of the industry, and to this end, 10-15% of their annual profits is spent on research and development. For six of the world's largest pharmaceutical companies¹⁰—Merck, Bristol-Myers Squibb, Glaxo, SmithKline Beecham, Ciba-Geigy and Hoechst—their total annual research expenditure adds up to \$2.2 thousand million on what might be called conventional threats to health, such as cardiovascular disease, cancer, rheumatism, Alzheimer's disease, malaria, AIDS, and many other physical disorders. The elimination of the life-shortening consequences of drug addiction, through the existence of an 'ideal drug', is clearly not a priority subject for pharmaceutical research. Until it is, the drug problem will continue to grow.

SSD—A Warning

When Matthew Huxley proposed a Socially Santionable Drug, or SSD, he made a number of stipulations which will undoubtedly meet with the approval of all if and when an SSD becomes available.

- No pharmaceutical company must be allowed by itself to release any SSD to the public.
- Government approval of proposed development of SSD by type and characteristic of proposed product is necessary.

- Any drugs produced must be subject to continuous government testing in a regular review procedure of manufacturing facilities.
- Certification of any system dispensing the SSD is essential; any ties with the manufacturers must be prohibited. These dispensaries must also exclude pharmacies and they should be designed and operated as recreational places, like English pubs, and licensed as such.

The Need for Better Surrogates

Aldous Huxley wrote in *The Doors of Perception*:

When for whatever reason, men and women fail to transcend themselves by means of worship, good works and spiritual exercise, they are apt to resort to religion's chemical surrogates.



Anthony R. Michaelis

At the end of the second millennium, we deserve better chemical surrogates, the best that interdisciplinary research can find and organic chemistry can synthesise.

Literature cited

1. A. Huxley, *Brave New World*, Chatto & Windus, London (1932).
2. J. D. Bernal, *The Social Function of Science*, Routledge, London (1939).
3. M. Huxley, Criteria for a socially sanctionable drug. *Interdisciplinary Science Reviews* 1, 176 (1976).
4. R.P. On the ganja trail. *Frontline*, 11 November 1989.
5. J.-F. Couvrat and N. Pless, *La Face cachée de l'économie mondiale*. Paris (1989).
6. Privileged communication to the author, New Delhi, 1 December 1989.
7. S. K. Ghosh, *The Traffic in Narcotics and Drug Addiction*, Ashish, New Delhi (1987).
8. Goethe, *Faust*, Im Insel Verlag, Leipzig [ND].
9. P. R. Furst (Ed.), *Flesh of the Gods—The Ritual Use of Hallucinogens*, Praeger, New York (1972). Contains contributions from R. E. Schultes, 'Overview of Hallucinogens in the Western Hemisphere'; R. Gordon Wasson, 'What was the Soma of the Aryans?'; W. A. Emboden, Jr., 'Ritual Use of *Cannabis sativa* L.: A Historical-Ethnographic Survey'; W. La Barre, 'Hallucinogens and the Shamanic Origin of Religion'.
10. P. Marsh, Prescribing all the way to the bank. *New Scientist*, 18 November 1989.

Acknowledgements

I should like to thank Matthew Huxley of Washington, DC, very sincerely for commenting on a draft of this Editorial (private communication, 29 January 1990). Some of the information was derived from various newspapers and the *Encyclopaedia Britannica*, 15th Edition. Particularly helpful was M. Amberger-Lahmann and D. Schmähl, *Gifte—Geschichte der Toxikologie*, Springer-Verlag, Heidelberg (1988) for its detailed reviews of the history of narcotics, of drugs and of the various disciplines of toxicology. Estimates and statistics for the US drug problem are from H. Hogan and colleagues, 'The Drug Problem', *Congressional Research Services Review*, November-December 1989, pp 1-21. Also relevant should be: M. Klein, F. Sapienza, H. McClain Jr and I. Khan (Eds), *Clandestinely Produced Drugs, Analogues and Precursors. Problems and Solutions*, Proceedings of an international conference, Rabat, Morocco, September 1987, United States Department of Justice, Drug Enforcement Administration, Washington, DC (1989).