



Poppers & AIDS

With Annotated Bibliography

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DEATH RUSH:

Poppers* & AIDS

John Lauritsen
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*Nitrite inhalants

DEATH RUSH:
Poppers* & AIDS
(With Annotated Bibliography)

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THE AUTHORS

Hank Wilson, a long-time gay activist in San Francisco, founded the Committee to Monitor Poppers in the fall of 1981. Since then, Wilson and the Committee have assembled a formidable collection of medical and other literature on the nitrite inhalants, have corresponded with researchers and public officials internationally, and have played a leading role in sounding the tocsin on the dangers of poppers. Wilson was a founder of the Gay Teachers Coalition, a founder of the Harvey Milk Gay and Lesbian Democratic Club, a founder of the Butterfly Brigade (a gay self-defence group), and a founder of Community United Against Violence.

John Lauritsen received his A.B. degree from Harvard (Department of Social Relations), and has fifteen years of experience as a market research executive and analyst. Lauritsen is co-author of **The Early Homosexual Rights Movement (1864-1935)** and has edited the John Addington Symonds anthology, **Male Love: A Problem in Greek Ethics and Other Writings**.

I. POPPERS & AIDS

Don't use poppers. This is the first and the last thing to be said about them.

Poppers are a liquid mixture of isobutyl nitrite and other chemicals, packaged in small bottles under such names as "Rush", "Ram", "Thunderbolt", "Locker Room", and "Crypt Tonight" (gallows humor?). Poppers are advertised and sold to gay men, who make up virtually the entire market for the commodity. When inhaled just before orgasm, poppers seem to enhance and prolong the sensation. With regular use, they become a sexual crutch, and many gay men are incapable of having sex, even solitary masturbation, without the aid of poppers.

Poppers have become an accepted, even obligatory part of the gay male lifestyle in some cities. The odor of poppers is ubiquitous in New York City bars, back-rooms and baths. At gay discos, men shuffle around on the dance floor, zombie-like, holding popper bottles under their noses.

The subject of poppers is one which arouses intense emotions. Ordinarily rational men become hysterical when it is suggested that the nitrite inhalants are harmful to the health and may play a role in causing AIDS. This is understandable. Since poppers have become necessary for them to function sexually, giving up poppers would seem, at least in the beginning, like giving up sex itself.

Normally every drug in the U.S. must undergo extensive testing before it can be sold legally. Not poppers. They are subject to no testing or quality control whatsoever. In 1981, the Stanford Medical Laboratories tested some samples of different brands of

poppers, and found them to contain kerosene, hydrochloric acid, and sulfur dioxide, among other impurities.

Profits

The biggest money-maker in the gay business world is believed to be the poppers industry. Gross profits were estimated to be \$50 million in 1978, and may well be double or triple that by now. (Sigell 1978)

Poppers manufacturers have impudently labelled their product a 'room odorizer', with the astounding consequence that the federal Food and Drug Administration (FDA), the California and New York Departments of Health, and other government regulatory agencies have intransigently looked the other way. What a farce! Not even an idiot would use poppers as a 'room odorizer'. Everyone knows that poppers are inhaled as a drug. A large and growing body of medical research indicates that poppers are dangerous, and almost certainly implicated in causing AIDS. And yet the government agencies blithely accept the lie that poppers are only a harmless 'room odorizer'.

Why have the appropriate government agencies refused to regulate poppers in any way? We don't know, but it's doubtful that they really believe the 'room odorizer' marketing subterfuge. If a drug like butyl nitrite can be marketed as a 'room odorizer', then anything could be sold as anything. Heroin could be sold as a mosquito-bite remedy ('for external use only'). Live hand grenades could be sold as 'paperweights'.

It is commonplace that government regulatory agencies come to be controlled by the very industries they were intended to regulate. One recalls the many recent scandals pertaining to the Environmental Protection Agency (EPA) or, a couple of decades ago, the subservience of the U.S. Department of Health to the

tobacco industry. The poppers industry has a large war chest, and they know how to "influence" government agencies.

Poppers are now illegal in New York State. On June 18, Governor Cuomo signed into law Assembly Bill #890, making it illegal to possess or sell "hazardous inhalants", including amyl and butyl nitrite, that cause intoxication.

It can be anticipated that some gay men will protest the new law as an intrusion of the state into their private lives, an infringement of their right to pursue chemical pleasures.

Such protests would be misguided. Anyone who has studied the medical literature on poppers can only applaud the New York State legislature and Governor Cuomo for having done the right thing. Poppers are dangerous, and they should never have been sold legally in the first place.

Poppers as co-factor for AIDS

At present, most if not all AIDS researchers believe that an important role in causing AIDS is played by a virus named Lymphadenopathy-Associated virus (LAV) by the French scientists who isolated it in 1983. (The same virus was "rediscovered" in 1984 by an American government scientist, Robert Gallo, who called it "HTLV-III", by which name it is known, for political reasons, in the U.S.)

The LAV virus has so far failed to satisfy Koch's postulates; therefore, its role in causing AIDS remains a matter of conjecture. The designation, "AIDS virus", is not scientifically justified; the most one can say at present is that the LAV virus is associated with AIDS:

perhaps as primary cause, perhaps as a subsidiary co-factor, or perhaps only as a harmless marker.¹

For several years, government agencies have discouraged any approaches to AIDS other than the single-infectious-agent hypothesis. Researchers who advanced drug abuse or multifactorial hypotheses tended to be ostracized and unfunded. After Robert Gallo's "discovery" of HTLV-III, it became obligatory to regard this as the primary or even sole cause of the Syndrome.

However, preliminary testing has shown that up to 80% of urban gay men have LAV antibodies, and yet only a minute percentage of them have developed AIDS. It would seem that LAV is not sufficient by itself to cause AIDS, that co-factors (like drug abuse) may be necessary for AIDS to develop.

Many AIDS researchers now believe that mere exposure to the putative virus is not sufficient to cause AIDS--that a necessary precondition may be an already-weakened immune system. Attention is being focussed on possible co-factors in the lifestyles of gay men and IV drug users, the two major risk groups.

Toxic effects of amyl nitrite (the pharmaceutical predecessor of "Rush", "Locker Room", etc.) have been known for years. With the outbreak of the AIDS epidemic, medical researchers began to suspect that poppers may play a role in causing AIDS in gay men--either as the primary cause or in conjunction with other factors. (Durack 1981)

¹See APPENDIX A: Koch's Postulates: The Case Against LAV/HTLV-III's Being the Sole, Sufficient, or Necessary Cause of AIDS.

Few gay men, physicians, or AIDS researchers seem to be aware how extensive and powerful the evidence against poppers is. Anyone who has studied even a portion of the medical literature can only shake his head in amazement that this dubious commodity has not been banned—except in Massachusetts, Wisconsin, and, as of June 1985, New York State. (In Massachusetts, where poppers have been banned for years, only 378 cases of AIDS had been reported as of 31 March 1986. In contrast, there had been 6265 cases in New York, where poppers had been sold legally in sex shops, baths, discos, and even neighborhood smoke shops.)

The evidence against poppers has continued to accumulate. For several years, major articles in the most prestigious medical journals in the world have discussed the immunosuppressive and other harmful effects of poppers, and their possible role in causing AIDS. The question is no longer whether, but rather how much of a role poppers play in causing AIDS. Are poppers a relatively minor or a very major co-factor? So far as the effect of poppers on the health, there is no doubt that they are harmful. For some individuals, even a single episode of snorting poppers can be life-threatening.

The section that follows will summarize medical findings on poppers. However, the reader should bear in mind that this is a summary of hundreds of pages of reports and articles. Researchers concerned with the poppers connection should consult the Annotated Bibliography in Section II of this monograph.

* * *

THE SCIENTIFIC PICTURE

The evidence against poppers comes from many different types of studies, and is remarkably consistent. Whether from epidemiological, mice, or laboratory studies, the data support each other in demonstrating the harmful properties of poppers and implicating poppers in the etiology of AIDS. Despite rumors which originated with the poppers industry in 1983, there is no evidence that could reasonably be interpreted as 'exonerating' poppers.

Epidemiological studies

Unfortunately, we know very little about the characteristics of people with AIDS. Most of the published epidemiological studies of gay men with AIDS were conducted several years ago, and had serious shortcomings. CDC studies, in particular, tended to be poorly designed, executed, and analyzed. We cannot assume that gay men diagnosed as having AIDS in 1986 have the same profile as the first 50-100 gay men with AIDS, who were studied in 1981-1982.

In the absence of recent, large-scale, well-conducted epidemiological studies, one may give a cautious hearing to less 'scientific' evidence, such as reports from those who have known many people with AIDS. Such evidence should be evaluated critically, though it may actually be worth more than the quantitative 'data' from a poorly executed survey.

Following are a few epidemiological highlights:

- 96-100% of the gay men with AIDS used poppers, usually quite heavily. These men were also heavy users of many other "recreational" drugs, including amphetamines ("speed"), cocaine, heroin, quaaludes ("ludes"), LSD, barbiturates

("downers"), and ethyl chloride. (Friedman-Kien 1982, Haverkos 1982/1985, Jaffe 1983)

- Case-control studies have implicated poppers as a statistically significant and important risk factor for the development of AIDS. (Marmor 1982, Newell 1985)
- In gay men who do not (yet) have AIDS, popper usage is correlated with immunological abnormalities similar to those found in AIDS patients. (Goedert 1982)
- Among men with swollen lymph nodes (all of whom had used poppers), heavy popper users were more likely to develop AIDS. (Mathur-Wagh 1984/1986)
- A recent study compared two groups of gay men who were antibody positive to the LAV (HTLV-III) virus: people who were clinically sick with AIDS, and people who were not sick. Usage of the nitrite inhalants proved to be one of the most important risk factors for developing AIDS, and especially, Kaposi's sarcoma. The heavier the popper usage, the greater the risk. (Moss 1985)
- Leaders of People With AIDS, who have known hundreds of PWA's, state that most of them were heavily into drugs, and all of them used poppers.
- W.J. Wallace, the manager of the Mineshaft, stated in an interview, "I really don't know anybody who's had AIDS who hasn't used drugs."
- Finally, there is the crucial point that for 5 years AIDS, unlike a truly communicable disease, has remained compartmentalized. Gay men ac-

counted for three-quarters of the AIDS cases 5 years ago, and account for the same proportion now in 1986. Poppers are used by gay men. They are used by very, very few straight men, and by virtually no women at all.

Mutagenesis

Two different experiments have demonstrated that poppers are mutagenic. That is, they cause genes to mutate. (Quinto 1980, Osterloh 1984) It is very unwise to inhale mutagenic substances, as almost all such substances are also carcinogenic. If nothing were known about poppers other than these two studies, they alone would be sufficient warrant for the categorical recommendation: Do not use poppers.

Carcinogenesis

Organic nitrites like poppers combine with other substances to form deadly, cancer-causing compounds (N-nitroso compounds, nitrosamines--Jørgensen 1982, Newell 1984, Osterloh 1984). Danish scientists Karl Jørgensen and Sven-Olov Lawesson describe N-nitroso compounds as being so deadly as to have 'the capacity to induce cancer after only one dose'.

Several AIDS researchers have suggested that poppers may play a role in causing the cancer, Kaposi's sarcoma, in gay male AIDS patients. KS is found in about half of the gay men with AIDS, but in a very small percentage of PWA's from the other risk groups. It is gay men who use poppers, not straight IV drug users or Haitians.

Blood cell studies (*in vitro*)

Several different laboratory experiments have shown that exposure of human blood cells to amyl, butyl or isobutyl nitrite causes sharp decreases in immunological function, as well as striking alterations in cell structure ("cytoplasmic protrusions with pseudopod-like

extensions', etc.). (Marmer 1982, Hersh 1983, Jacobs 1983)

One research team concluded:

"These abnormalities can help in explaining the role of amyl nitrite cellular toxicity in immunosuppressed male homosexuals." (Marmer 1982)

Another research team stated:

"These in vitro studies strongly suggest that the inhalant nitrites may indeed be dangerous, and their use should be condemned by those physicians who treat patients who use these drugs regularly." (Hersh 1983)

Mice studies

Powerful evidence against poppers comes from experiments on mice, which have firmly established that poppers suppress the immune system and are otherwise harmful in vivo (in a living animal).

- Five different studies found that exposure to amyl or isobutyl nitrite, either through injection or inhalation, caused immunological deficiency in mice. (Watson 1982, Neefe 1983, Lotzová 1984, Gangadharam 1985, and Ortiz 1985)

One research team concluded:

"The results of these studies indicate that immunosuppression should be added to the other reasons why isobutyl nitrite should not be used by man." (Lotzová 1984)

One of these studies further found that the mice exposed to nitrite vapors suffered gross pathological lung damage, weight loss, and, most significantly, reversed T-cell ratios:

"Our studies do show that chronic inhalation of AN [amyl nitrite] can lead to an altered T-cell helper/-

suppressor ratio, the same phenomenon which occurs in AIDS victims. It does look, then, that there seems to be a link between AN inhalation and cellular immunity depression." (Ortiz 1985)

- In a sixth study, mice exposed to low dosages of isobutyl nitrite vapors developed methemoglobinemia and thymic atrophy. (Lynch 1985) The first finding is relevant, since poppers are known to cause methemoglobinemia in humans (Horne 1979, Guss 1985) and since anemia is typically part of the AID Syndrome. (Methemoglobinemia is a form of anemia where the blood turns brown and where the oxygen supply to critical organs is reduced.) The finding of "thymic atrophy" is suggestive. Autopsies of AIDS victims show the thymus gland to be destroyed in 100% of the cases. No thymus gland, no immune system. Obviously any drug that destroys the thymus gland will play a role in causing AIDS.
- A seventh mice study could not be carried through to completion. Regardless of whether the isobutyl nitrite was ingested, inhaled, or injected, all of the mice died. (Maickel 1982)

T-cell ratios

Inhalation of amyl nitrite caused a depletion of the helper (T4) T-cells in mice (Ortiz 1985) and in humans (Gerblich 1984). Some researchers consider this condition--a reversed T-cell ratio--to be the primary immunological defect in AIDS patients.

Toxicology

Quite aside from the risk of getting AIDS, poppers are known to be hazardous to the health in many different ways. Poppers cause Heinz body cell anemia, methemoglobinemia, lung damage, serious skin burns, death or brain damage from cardiovascular collapse or stroke,

dizziness, and headaches. Poppers have been used successfully to commit suicide (by drinking) and murder (victim gagged with sock soaked with poppers). (Sigell 1978, Horne 1979, Haley 1980, Dixon 1981, Romeril 1981, Guss 1985, Lynch 1985, Ortiz 1985)

AIDS: Why now?

The chronology is suggestive: Poppers became a fad among gay men beginning in 1972, just seven years before the first cases of AIDS began to be diagnosed. (Newell 1984)

* * *

It is obvious from the above that poppers are dangerous and should not be used by humans or other animals. In the context of the AIDS epidemic, when keeping one's immunological system up to par is a life or death matter, the only sane course of action is to stop using poppers immediately.

Risk-reduction guidelines

Even with considerable human resources and millions of dollars committed to finding a solution, it may very well take many years before researchers are able to describe, with scientific rigor, how AIDS is caused. In the meantime, it is imperative that intelligent guidelines for reducing the risk of getting AIDS, based on existing knowledge, be given now. Lives are at stake.

In light of what is known now, gay men should continue to follow 'safe sex' guidelines. In conservative terms, this would mean either practising celibacy or limiting sex to simple body contact and mutual masturbation. The simple rule for safe sex is: "On me, not in me."

At the same time, it is crucial for gay men to bolster their immune systems by living in a healthy way: eating nutritious food, getting enough sleep and rest, reducing stress, and getting plenty of exercise. They should avoid the use of any and all "recreational drugs"²—especially including poppers.

²By "recreational drugs", we are not referring to coffee or chamomile tea. The drugs that were used heavily by the gay men with AIDS who were studied in 1981-1982 included not only poppers, but barbiturates, amphetamines, cocaine, heroin, ethyl chloride, LSD, PCP, and quaaludes ("ludes"). (Haverkos 1985) Looking at this menu of drugs, the question is not, "Could it be that one of these drugs is harmful?" They are all harmful. Ethyl chloride, for example, causes brain damage every time it is inhaled.

Heroin is known to be immunosuppressive, causing, among other things, a depression of T-cell number and function in opiate addicts. (References in Quagliarello 1982.)

And then there is alcohol, which may be benign when used in moderation, but which is one of the most toxic of all drugs when used heavily. Physicians in New York City, who have treated many hundreds of patients with AIDS, have stated that a large proportion of these men were alcoholics.

Anyone who feels he may have a drug/alcohol problem should get help. Unless emergency medical attention is needed, the best first step would probably be to telephone Alcoholics Anonymous or Narcotics Anonymous, depending on the nature of the addiction.

II. NITRITE INHALANTS: A BIBLIOGRAPHY

Centers for Disease Control. "An Evaluation of the Immunotoxic Potential of Isobutyl Nitrite". **MMWR**, pp. 457-58, 64, 9 September 1983.

This news item briefly described an experiment in which mice were exposed to isobutyl nitrite vapors, in various concentrations, for time periods ranging from 3 to 18 weeks. It asserted, "None of the animals exposed to IBN showed any evidence of immunotoxic reactions".

The poppers industry used this little item as the basis for an advertising campaign which claimed that poppers had been "exonerated", and that there was no connection between poppers and AIDS.

When a report on the mice study was finally published two years later, it became clear that the **MMWR** account had been grossly misleading. The dosages administered were too low to test the hypothesis that poppers might be immunosuppressive or otherwise harmful to men who inhaled them as "recreational" drugs. The study had selected exposures "to mimic an occupational exposure setting...rather than to conduct brief, high-level exposures to imitate exposure by nitrite abusers." (See entries under Lewis and Lynch.)

It should be noted that other mice experiments (Gangadharam, Lotzová, Maickel, Neefe, Ortiz, and Watson) have demonstrated that mice exposed to alkyl nitrites do develop immunological deficiency, as well as being harmed in other ways.

The anonymous author(s) of the **MMWR** piece stress that the nitrite inhalants are not harmless, for

"these drugs do have toxic effects", and they proceed to list a number of toxic effects, ranging from "dizziness" to "sudden death". They add that "their role as a cofactor in some of the illnesses found in this syndrome has not been ruled out."

D'Eramo, James E. "Poppers: The Writing on the Wall". **New York Native**, p. 9, 4-17 June 1984.

This article reports on recent findings that tend further to implicate the nitrite inhalants as playing a role in causing AIDS.

The popular media are currently touting the LAV/-HTLV-3 virus as being the only cause of AIDS. However, D'Eramo reports that one of the French scientists who discovered the virus puts forward a multifactorial model of causation:

"Dr. J.C. Chermann (a member of the Parisian Pasteur Institute team that discovered the probable viral cause of AIDS - LAV-HTLV-3) presented a model for the development of AIDS during a lecture on May 22 at Sloan-Kettering Memorial Hospital in New York City. He believes that the T-cell population must be repeatedly stimulated with foreign antigens (like LAV, sexually transmitted diseases, and drugs) for full-blown AIDS to develop. Repeated usage of poppers may play an important role in the antagonistic stimulation of the helper T-cell population. According to Dr. Chermann's model, very limited or infrequent exposures to LAV would not in themselves lead to the development of full blown AIDS."

D'Eramo concludes:

"The untoward effects of inhaling poppers are becoming clearly recognized, especially as a co-factor in the development of AIDS."

Dixon, D.S.; Reisch, R.F.; and Santinga, B.S. "Fatal Methemoglobinemia Resulting from Ingestion of Isobutyl Nitrite, a 'Room Odorizer' Widely Used for Recreational Purposes". **Journal of Forensic Sciences**, pp. 587-93, July 1981.

A clinical account of a 30-year old black male who died from "acute nitrite poisoning". He had apparently swallowed some poppers liquid. Contains a description of unsuccessful emergency procedures used, results of the autopsy, as well as a discussion of other butyl nitrite-related fatalities and the various hazards of alkyl nitrite inhalant abuse.

Durack, David T. "Opportunistic Infections and Kaposi's Sarcoma in Homosexual Men". **New England Journal of Medicine**, pp. 146567, 10 December 1981.

This lead editorial poses the question of why AIDS is apparently new, since both viruses and homosexuality are at least as old as history:

"Some new factor may have distorted the host-parasite relation. So-called 'recreational' drugs are one possibility. They are widely used in the large cities where most of these cases have occurred, and the only patients in the series reported in this issue who were not homosexual were drug users.... Perhaps one or more of these recreational drugs is an immunosuppressive agent. The leading candidates are the nitrites, which are now commonly inhaled to intensify orgasm.... Let us postulate that the combined effects of persistent viral infection plus an adjuvant drug cause immunosuppression in some genetically predisposed men."

Friedman-Kien, Alvin E.; Laubenstein, Linda J.; Rubenstein, Pablo; et al. "Disseminated Kaposi's Sarcoma

in Homosexual Men'. **Annals of Internal Medicine.**
pp. 693-700, June 1982.

A study of 19 men with KS. "All of the patients had used amyl or butyl nitrite inhalants."

Gangadharam, P.R.J.; Peruman, V.K.; et al. "Immuno-suppressive Action of Isobutyl Nitrite" (Presentation to the International Congress on Immunopharmacology, Florence, Italy, May 1985.) (Also press release reported in various newspapers)

Researchers at the National Jewish Center for Immunology and Respiratory Medicine in Denver found evidence confirming long-held suspicions that the "recreational" use of nitrite inhalants (poppers) greatly increases the risk of developing the Acquired Immune Deficiency Syndrome (AIDS).

Their studies involved exposing mice to RUSH® (isobutyl nitrite) "by inhalation in a closed environment, simulating the practice of the homosexual patient". One group of mice was exposed to RUSH® daily; another group, every other day; and a third group, twice per week. According to the principal investigator, P.R.J. Gangadharam, PhD, after breathing isobutyl nitrite the animals became highly susceptible to disease and death caused by Mycobacterium intracellulare. This group of organisms, related to tuberculosis, is among the leading killers of people with AIDS. Mice of the same breed, who were exposed to the bacteria but not to the drug, had far lower illness and mortality rates.

The Denver scientists also linked specific, dose-related immune-system damage to isobutyl nitrite exposure:

"The animals exposed to the compound had decreased numbers of lymphocytes and macro-

phages, blood cells that are important in defending the body against infections.'

Dr. Gangadharam made the point that only a very small percentage of people exposed to the putative AIDS virus (LAV) become sick, and even fewer develop AIDS. 'This makes it very important to investigate other possible contributing factors.'

The researchers concluded:

'We believe our findings establish that inhaling isobutyl nitrite should be considered dangerous to homosexuals and others at high risk for developing AIDS.'

Gerblich, Adi A.; Campbell, Ann E.; Schuyler, Mark R.
"Changes in T-cell Lymphocyte Subpopulations After Antigenic Bronchial Provocation in Asthmatics".
New England Journal of Medicine, pp. 1349-52, May 1984.

In this study it was found that some kinds of inhaled agents caused a depletion of the helper (T4) T-cells. Some researchers consider this condition--a reversed T-cell ratio--to be the primary immune defect in AIDS patients.

In a communication to Dr. D'Eramo of the **New York Native**, Dr. Gerblich stated: 'The same results have been found upon inhalation of amyl-nitrites.'

Goedert, James J.; Neuland, Carolyn Y.; Wallen, William C.; et al. 'Amyl Nitrite May Alter T Lymphocytes in Homosexual Men'. **The Lancet**, pp. 412-16, 20 February 1982.

This study collected clinical, virological, and immunological data on 2 homosexual men with KS and on 15 healthy homosexual volunteers. Both men with

KS had been regular amyl/butyl nitrite users. Of the men who did not have KS, 8 were regular nitrite users (1-20 times per month) and the other 7 were not (i.e., fewer than 10 doses ever).

Immunological abnormalities were found in all of the nitrite users, but in only one of the non-users. The authors conclude:

"The data suggest that nitrites may be immunosuppressive in the setting of repeated viral antigenic stimulation and may contribute to the high frequency of KS and opportunistic infections in homosexual men."

Guss, David A.; Normann, Sven A.; and Manoguerra, Anthony S. "Clinically Significant Methemoglobinemia from Inhalation of Isobutyl Nitrite". **American Journal of Emergency Medicine**, pp. 46-47, January 1985.

A case report of a 21-year old gay man who almost died from methemoglobinemia which resulted from an episode of inhaling poppers. The night before admission to the emergency room he had swallowed methaqualone (Quaalude®), had inhaled cocaine, and had inhaled 'Hardware' (isobutyl nitrite) every 2-3 minutes for a period of 5-6 hours. His skin was purplish ('cyanotic'), and he had "severe headache, nausea, vomiting, chest pain, and shortness of breath." "Arterial blood gas samples were extremely dark.... Methemoglobin was 37% of all hemoglobin." Emergency measures were successful; the patient survived, and was found to have normal methemoglobin reductase levels.

The authors comment:

"Compared with the patient reported by Horne and associates [see Horne entry], our patient presented with severe systemic symptoms, had a

methemoglobin level of more than twice that previously reported, and had normal methemoglobin reductase levels. In addition, our patient presented more than 12 hours after his last exposure to nitrites. Considering that the estimated half-life of methemoglobin is 55 minutes, this suggests peak levels of methemoglobin were probably considerably greater than those measured.'

This report is important for two reasons: First, it demonstrates that life-threatening methemoglobinemia can result from butyl nitrite inhalation, even in an individual whose body has a normal ability to reduce methemoglobin. Second, it strongly suggests the possibility of drug interaction effects, whereby the combination of butyl nitrite plus one or more other 'recreational' drugs may be much more deadly than any one of these drugs by itself.

Haley, Thomas H. 'Review of the Physiological Effects of Amyl, Butyl, and Isobutyl Nitrites'. **Clinical Toxicology**, pp. 317-29, 1980.

Contains a two-page summary of 'human toxicology' re nitrites. 115 references listed. A few highlights:

"The toxic effects of amyl nitrite inhalation include rapid flushing of the face, pulsation in the head, cyanosis, confusion, vertigo, motor unrest, weakness, yellow vision, hypotension, soft thready pulse, and fainting. Accidental prolonged inhalation of amyl nitrite has resulted in death from respiratory failure.... Fatalities have occurred in workers exposed to organic nitrates after strenuous exercise 1 to 2 days after cessation of exposure. Nitrite causes a loss of tone of the vascular bed and pooling and trapping of blood in the veins of the lower extremi-

ties, resulting in marked arteriolar constriction and the induction of anoxemia in vital tissues, causing death. Hypertrophy of the left ventricle occurs in workers handling nitroglycerine, and they suffer from shortness of breath on undue exertion. The formation of methemoglobin by aliphatic nitrite interferes with oxyhemoglobin, causing anoxia of vital organs....The use of volatile nitrites to enhance sexual performance and pleasure can result in syncope and death by cardiovascular collapse."

Haverkos, Harry W.; Pinsky, Paul F. et al. "Disease Manifestation among Homosexual Men with Acquired Immunodeficiency Syndrome (AIDS): A possible role of nitrites in Kaposi's sarcoma". A study of the CDC AIDS Activity, Center for Infectious Diseases, 1982. Abridged version published in **Sexually Transmitted Diseases**, pp. 103-08, October-December 1985.

87 of the first cases of homosexual men with AIDS were classified according to disease manifestation: Kaposi's sarcoma (KS) only, Pneumocystis carinii pneumonia (PCP) only, or both KS and PCP. Each group was compared to the others as well as to controls from an earlier CDC study. (See Jaffe 1983.)

The researchers concluded that "using nitrite inhalants may be associated with the occurrence of KS in patients with AIDS."

The Haverkos study gives us important information on the lifestyle characteristics of the homosexual men who were diagnosed as having AIDS in 1981 and early 1982. Dr. Haverkos and his colleagues found a high degree of drug abuse. Among the total 87 gay men with AIDS, the following levels of drug usage were recorded: Nitrite inhalants (pop-

pers) - 97%, marijuana - 93%, amphetamines - 68%, cocaine - 66%, LSD - 65%, quaaludes - 59%, ethyl chloride - 48%, barbiturates - 32%, heroin - 12%, any drug intravenously - 17%.

Multiple drug usage was the rule: 58% of the subjects used five or more different "street drugs". Furthermore, the 87 gay men with AIDS tended to use their drugs heavily. Following are the median numbers of different days on which the various drugs were used: Marijuana - 720, nitrite inhalants - 384, amphetamines - 120, barbiturates - 96, quaaludes - 60, LSD - 36.

Hersh, Evan M.; Reuben, James M.; Bogerd, Hal; et al.
"Effect of the Recreational Agent Isobutyl Nitrite on Human Blood Leukocytes and on in Vitro Interferon Production". **Cancer Research**, pp. 1365-71, March 1983.

The effect of isobutyl nitrite on cellular immunological functions was studied. The experimenters found that minute quantities of isobutyl nitrite caused irreversible impairment of immunological function. They conclude:

"We speculate that these immunosuppressive effects, combined with the ability of nitrates to convert amines to nitrosamines, may be related to the development of opportunistic infections and Kaposi's sarcoma in homosexuals who use this agent."

Dr. Hersh and his colleagues further state:

"These in vitro studies strongly suggest that the inhalant nitrates may indeed be dangerous, and their use should be condemned by those physicians who treat patients who use these drugs regularly."

Horne III, McDonald K; Waterman, Michael R.; et al.
"Methemoglobinemia from Sniffing Butyl Nitrite".
Annals of Internal Medicine, pp. 417-18, September
1979.

A man was admitted to a hospital emergency room, "complaining of a grayish complexion which developed after inhaling butyl nitrite". He was diagnosed as having methemoglobinemia, a form of anemia where the blood turns brown, and where the oxygen supply to critical organs is reduced. Several months later, the same man reappeared, again suffering from methemoglobinemia, again after butyl nitrite inhalation.

The patient was found to be methemoglobin reductase deficient, as was his father.

An experiment was performed in which the patient and 6 non-familial subjects were asked to sniff butyl nitrite (Locker Room "room odorizer") directly from the bottle for 12 minutes. As a result, the patient "clearly became gray", and had high methemoglobin concentrations. The 6 normal subjects also developed methemoglobinemia, to a lesser degree. The authors conclude:

"Sniffing butyl nitrite theoretically could lead to significant methemoglobin accumulation even in normal subjects, if the nitrite exposure were intense or if inadequate time were allowed between nitrite inhalations for methemoglobin reduction. The risk of clinical methemoglobinemia would, of course, be much higher in a person whose methemoglobin clearance rate is abnormally slow and who therefore requires a longer interval between sniffs to reduce the newly formed methemoglobin."

Jacobs, Richard F.; Marmer, Daniel J.; et al. "Cellular Immunotoxicity of Amyl Nitrite". **Journal of Toxicology- Clinical Toxicology**, 20(5), pp. 421-449 (1983).

[Abstract] *Functional deficits in lymphocyte interaction following occasional or chronic exposure to inhaled nitrites may be a potential contributing but not the [primary] etiologic factor in the acquired immunodeficiency syndrome (AIDS). We evaluated the effect of amyl nitrite vapors on mononuclear cell function and demonstrated functional deficits and structural alterations in these cells. In this closed, in vitro system, exposure of cells to amyl nitrite for up to 30 minutes did not affect cell viability. The functional deficits demonstrated were: inhibition of lymphocyte erythrocyte (E) rosette formation, a suppression of lymphocyte mitogen (phytohemagglutinin) and antigen (cytomegalovirus) transformation, a block in the S, G₂ and M phases of cell cycling and diminished cell cytotoxicity to CMV infected cells. These effects on cellular function were demonstrated following 5, 0, and 15 minutes of amyl nitrite vapor exposure; some effect on all cellular functions was demonstrated at 5 minutes. The structural alterations seen on scanning and transmission electron micrographs were: reduction of filopodia, smoothing of the cell profile, cytoplasmic protrusions with pseudopod-like extensions, an increase in rough endoplasmic reticulum with swollen cisternae, alterations in size and distribution of golgi components and exocytotic vesicles in the outer membrane of the nuclear envelope. These vesicles and increased membrane proliferation suggests an effect on the membrane synthesis mechanism in these cells. These effects may be a potential factor in the alterations of phenotypic markers on T Lymphocyte populations, as well as, a potential contributing

factor in the functional deficit of mononuclear cells in patients with AIDS.*

Jaffe, Harold W.; Keewhan, Choi; Thomas, Pauline A.; et al. "National Case-Control Study of Kaposi's Sarcoma and Pneumocystis carinii Pneumonia in Homosexual Men: Part 1, Epidemiologic Results". **Annals of Internal Medicine**, pp. 145-51, August 1983.

In this study of the first 50 AIDS patients, 96% used nitrite inhalants (and this would be 100% if the 2 "non-users" had misunderstood the question). Moreover, the AIDS patients were extremely heavy users, with a median lifetime exposure to nitrite inhalants of 336 doses. Most of the AIDS patients were also heavy users of many other "recreational drugs", including marijuana, cocaine, heroin, amphetamines ("speed"), barbiturates, quaaludes ("ludes"), LSD, ethyl chloride, and phencyclidine.

The control sample selected for this CDC study proved to be seriously flawed. Drawn from venereal disease clinics and private practices, many of the controls were far from healthy. Some had immunological abnormalities and swollen lymph glands, and several of them developed AIDS after the study was completed. Further, many of the controls appeared to belong to the "fast lane" segment of the gay male community, as witness such findings as that 51-60% of the controls were cocaine users, or that 21% of the private practice controls had been fist fucked.

Aside from the major sampling problems described above, the inherent bias of this study design is a bias towards unity. That is to say, the tendency would be falsely to overlook real risk factors, rather than falsely to identify risk factors that

were not real. The authors of the study admit as much:

"The expected impact of these potential problems in control selection and classification would be to minimize differences between cases and controls rather than to create false differences."

In light of the fatal flaws in sample design and selection, all analyses based upon comparison between the AIDS patients and the controls would be dismissed by most survey research professionals as "garbage in, garbage out". The comparative data are worthless, and should be ignored. The authors of this study did draw comparative conclusions, but they were wrong to do so.

Jørgensen, Karl A. and Lawesson, Sven-Olov. "Amyl Nitrite and Kaposi's Sarcoma in Homosexual Men". (letter) **New England Journal of Medicine**, pp. 1893-94, 30 September 1982.

The authors give the chemical formula whereby amyl or butyl nitrites can form carcinogenic N-nitroso compounds in the body—compounds so deadly as to have "the capacity to induce cancer after only one dose".

They conclude:

"We therefore find it appropriate to suggest that amyl nitrite may cause Kaposi's sarcoma in homosexual men."

Jørgensen's and Lawesson's theories are developed more fully in an article in the Danish medical journal, **Ugeskr Laeger**, of 13 December 1982).

Lewis, Daniel M.; Koller, Wayne; et al. "Subchronic inhalation of Isobutyl Nitrite in BALB/c Mice: II. Immunotoxicity Studies". [See also Lynch 1985

below.] **Journal of Toxicology and Environmental Health**, pp. 835-47, 1985.

This is a belated report on the research conducted in 1982-83, which the CDC newsletter **MMWR** of 9 September 1983 had summarized as indicating no "evidence of immunotoxic reactions". (See Centers for Disease Control 1983.) The **MMWR** news item was used by the poppers industry as proof that poppers had been "exonerated". As reports on other experiments began to appear (Gangadharam 1985, Lotzová 1984, Neefe 1983, Ortiz 1985, and Watson 1982), all finding that exposure to alkyl nitrites was immunosuppressive and otherwise harmful for mice, the CDC/National Institute for Occupational Safety and Health study became "odd man out".

Now that a report on the study has finally been published, it is clear why the government researchers failed to find "immunotoxicity", when all of the independent researchers did find it. The dosages administered, via inhalation of vapors, were far too low. The study, in effect, evaluated the effect of nitrite vapors approximating levels to be encountered as background exposure ("room odorizer", workers in a poppers factory), rather than those encountered when using poppers as a drug (i.e., inhaling directly from the bottle). The study is thus in the tradition of the "Poppers Bible". (See entry under Nickerson.) At the end of their "discussion", Lewis et al. issue a revealing disclaimer:

"The relevance of these dosages to human usage of these compounds is uncertain because persons who abuse aliphatic nitrites recreationally would have intermittent exposures of variable frequency at very high dosages with chemicals of unknown purity. Thus, this study did not attempt to model the recreational use of these drugs [emphasis added], but rather to simply evaluate the

immunotoxic potential, in any, of these compounds."

Lotzová, Eva; Savary, Cherylyn A.; Hersh, Evan M.: et al. "Depression of Murine Natural Killer Cell Cytotoxicity by Isobutyl Nitrite". **Cancer Immunology Immunotherapy**, pp. 130-134, vol. 17, 1984.

This important mice experiment demonstrated that isobutyl nitrite was NK-cell-suppressive in vivo after intravenous administration and, most importantly, also after inhalation.

In their "discussion" the authors state:

"Since in experimental animals NK cells have been implicated in the mediation of immune surveillance against tumors and resistance to various types of infections, the depression of NK-cell cytotoxicity by this agent could underlie the susceptibility of homosexual men to opportunistic infection and Kaposi's sarcoma. Furthermore, the observation that cytotoxic potential of activated NK cells was also reduced by this agent suggests that an attempt to augment NK-cell activity to promote resistance to infections and malignant disease in patients with severe immunodeficiency syndrome could fail in patients who continue to use isobutyl nitrite. Since a multifactorial depression of immunity and a certain duration of this depression probably sets the stage for successful infection of the presumed AIDS agent, the continued and prolonged use of isobutyl nitrite may play an important role in AIDS."

They conclude:

"The results of these studies indicate that immunosuppression should be added to the other

reasons why isobutyl nitrite should not be used by man."

Lynch, Dennis W.; Moorman, William J.; et al. "Subchronic Inhalation Toxicity of Isobutyl Nitrite in BALB/c Mice: I. Systemic Toxicity". [See also Lewis 1985 above.] **Journal of Toxicology and Environmental Health**, pp. 823-33, 1985.

This CDC/NIOSH study was intended to "present the toxicologic results of subchronic exposures of BALB/c mice to inhaled IBN." ("Subchronic" apparently means something like "less than acute".)

The salient point of their methodology is that the dosages administered were low, simulating those experienced by workers in a poppers factory³ (or by a feeble-minded individual using poppers as a "room odorizer"). Lynch et al. are reasonably candid in making their disclaimer:

"Exposures were selected to mimic an occupational exposure setting in order to fill this gap in the existing literature, rather than to conduct brief, acute high-level exposures to imitate exposure by nitrite abusers."

In light of the low dosages administered, it would not have been surprising if the mice had suffered no ill effects whatever, but this was not the case. The main toxic effects observed were mild damage to the lung tissues and the formation of methemoglobin. In addition, some of the mice developed

³Such workers were the focus of Appendix V by John O. Parker in the 'Poppers Bible'. (See entry under Nickerson.) Oddly, the government researchers list this poppers industry publication under their "References", as though it were a legitimate source.

thymic atrophy. The finding of methemoglobinemia is relevant, since poppers cause methemoglobinemia in humans (see Dixon, Guss, and Horne entries) and since anemia is typically part of the AIDS Syndrome. The finding of thymic atrophy is most suggestive: in autopsies of AIDS victims, the thymus gland is found to be destroyed in 100% of the cases. No thymus gland, no immune system. Obviously any drug that destroys the thymus gland will play a role in causing AIDS.

Maickel, Roger P. "Acute Toxicology of Butyl Nitrite". **Research Communications in Chemical Pathology and Pharmacology**, 26:75-83, 1979.

This paper discusses laboratory techniques for analyzing the various butyl nitrites. Butyl nitrites were administered intravenously to mice, with liver damage and death resulting.

"Administration of isobutyl, n-butyl, sec-butyl or tert-butyl alcohols to mice produced similar hepatotoxicity, suggesting that butyl alcohols may play a role in the hepatotoxicity observed after sBN or tBN administration."

_____ (interview). **Moneysworth**, January, 1982.

USERS OF DISCO DRUG DIE OF ITS DELIGHTS

CHICAGO--Butyl nitrite--a legal but potentially lethal substance used to enhance sexual pleasure and drive disco dancers to ecstatic frenzy--is creating a new type of hazard, a toxicologist warns.

"If you get enough of it in your body, the chances of saving you are zero," Purdue University professor Roger Maickel says of the chemical marketed variously as "Rush," "Locker Room," "Climax," and "Discorama." "And you may be an unwitting victim, he adds. "It has been reported that these

compounds are sprayed out over disco floors to rev up dancers."

Although no deaths from inhalation have been reported, Maickel says, in the last year there have been at least two reported deaths from swallowing the drug.

He says a Purdue study found butyl nitrites were fatal to mice in fairly small doses. "The blood turns brown--it can't carry oxygen," he says. "What's interesting is that the butyl nitrites were fatal no matter how they were administered--orally, by injection or just by exposing the mice to the compound in the air."

Government agencies have not banned butyl nitrite, he says, because they have not been marketed as drugs. "Some federal agency ought to take a stand," Maickel asserts, "before there is a spate of deaths that could have been avoided."

Marmer, D.J.; Jacobs, R.F.; and Steele, R.W. "In Vitro Immunotoxicity of Amyl Nitrite. **Clinical Research**, p. 5, vol. 30, no. 5, 1982.

Exposing mononuclear cells to amyl nitrite vapors resulted in various cellular abnormalities. The authors conclude:

"These abnormalities can help in explaining the role of amyl nitrite cellular toxicity in immuno-suppressed male homosexuals."

Marmor, Michael; Friedman-Kien, Alvin E.; Laubenstein, Linda; et al. "Risk Factors for Kaposi's Sarcoma in Homosexual Men". **The Lancet**, pp. 1083-87, 15 May 1982.

A study of 20 homosexual men with KS and 40 healthy controls. All of the men with KS had been nitrite users. Multi-variate analysis indicated that

use of amyl nitrite was an independent and statistically significant risk factor for KS.

In the light of their data, the authors consider a tenable hypothesis to be:

"Use of amyl nitrite may have caused Kaposi's sarcoma either by directly causing immunosuppression, thereby allowing expression of a sexually transmitted oncogenic virus; or by allowing an unknown carcinogenic agent, otherwise controlled by the immune system, to operate; or by acting as a direct or metabolically activated carcinogen."

Mathur-Wagh, Usha; Enlow, Roger W.; et al. "Longitudinal Study of Persistent Generalised Lymphadenopathy in Homosexual Men: Relation to Acquired Immunodeficiency Syndrome". *The Lancet*, pp. 1033-38, 12 May 1984.

The authors conducted a 30-month tracking study (commenced in February 1981) of 42 homosexual or bisexual men with persistent lymphadenopathy, not attributable to an identifiable cause.

Although intravenous drug users were excluded from the sample, "Non-parental [non-needle] recreational use of drugs, including amphetamines, marijuana, and cocaine, was common, and all had inhaled nitrite." (emphasis added)

In the course of the study, 8 subjects (19%) developed AIDS. Previous heavy nitrite inhalant use proved to be the most important factor distinguishing the 8 patients who developed AIDS from the 34 who did not.

"The nitrite use/outcome association was still statistically significant ($p < 0.01$) after adjustment for numbers of sexual contacts. The contacts/-

outcome association was only marginally significant after adjustment for nitrite use ($p<0.1$).¹ [In other words, based on this study, nitrite inhalant use is implicated more strongly than multiple (100+/year) sexual partners as a factor in causing AIDS. "Promiscuity" might therefore be regarded as a marker for the use of poppers, rather than the other way around.]

Mathur-Wagh, Usha; Mildvan, Donna; et al. "Follow-up at 4 1/2 Years on Homosexual Men with Generalized Lymphadenopathy". (letter) **New England Journal of Medicine**, 12 December 1985.

The authors report on their study of 42 male homosexual patients with lymphadenopathy (unexplained and persistent lymph gland swelling). They had observed these patients medically for four and a half years, making this the longest tracking study of its kind so far.

By this time, twelve of the 42 patients (29%) had developed full-fledged AIDS. A previous history of moderate to heavy use of nitrite inhalants appeared to be implicated in causing these men to develop AIDS, and in particular, Kaposi's sarcoma.

"Nitrite inhalants may act alone or in combination with other, as yet unidentified cofactors after AIDS retrovirus-induced immunodeficiency, by promoting the specific disease manifestation of Kaposi's sarcoma."

Mayer, Kenneth H. "Inhalation-Induced Immunosuppression: Sniffing Out the Volatile Nitrite-AIDS Connection". **Pharmacotherapy**, pp. 235-36, September 1984.

In this editorial, accompanying the article by Guy Newell and colleagues (which see), Mayer states:

"Newell et al. develop several interesting lines of reasoning as to how nitrite inhalation could be clinically important. Volatile nitrite inhalation might potentiate the development of AIDS because of perianal vasodilation that could enhance the absorption of an immunosuppressive substance or infectious agent. The nitrites could be significantly immunosuppressive themselves, or the conversion to nitrosamines could result in increased mutagenic or carcinogenic events. These are plausible theories that are not deflated by the elucidation of HTLVIII/LAV....

"They have raised sufficient concern about the use of volatile nitrites to warrant unequivocal disapproval of the use of these drugs at this time."

Mayer, Kenneth and D'Eramo, James. "Poppers: A Storm Warning". **Christopher Street**, pp. 46-49, issue 78.

A useful summary of medical knowledge about poppers, their deleterious side effects and possible role in the etiology of AIDS.

Moss, Andrew. "A Case-Control Study of Risk Factors for AIDS in San Francisco". (Presentation to the CDC AIDS Conference in Atlanta, 15 April 1985)

This study compared two groups of gay men who were antibody positive to the LAV (HTLV-III) virus: people who were clinically sick with AIDS, and people who were not sick.

Usage of the nitrite inhalants proved to be one of the most important risk factors for developing

AIDS, and especially, Kaposi's sarcoma. The heavier the popper usage, the greater the risk.

Neefe, J.R.; Ganjii, A.; and Goedert, J.G. "Daily Amyl Nitrite Inhalation Decreases Mouse Splenocyte Response to Concanavalin A". (abstract 3850) **Federation Proceedings** 42 (4): 949, 5 March 1983.

Inhalation of amyl nitrite for 2 minutes, 5 days per week, caused progressive immunosuppression in mice. "After as little as 5 days exposure, a trend to decreased response to the T cell nitrogen Con A... was noted."

The authors conclude:

"These data suggest that nitrites may have a primary or contributory role in AIDS."

Newell, Guy R.; Adams, Stephen C. et al. "Toxicity, Immunosuppressive Effects and Carcinogenic Potential of Volatile Nitrates: Possible relationship to Kaposi's Sarcoma". **Pharmacotherapy**, pp. 235-36, September 1984.

This article provides an overview of research demonstrating the adverse effects of poppers. Especially useful for its chronological history of the abuse of nitrite inhalants as recreational drugs and for data on how deadly, cancer-causing N-Nitroso compounds are formed by an interaction of nitrates with any of a long list of common drugs and chemicals, including artificial sweeteners, antihistamines, pain killers and methadone.

Newell, Guy R.; Mansell, Peter W.A.; Wilson, Michael B.; et al. "Risk Factor Analysis among Men Referred for Possible Acquired Immune Deficiency Syndrome". **Preventive Medicine**, pp. 81-91, January 1985.

In this case-control study, lifestyle factors of 31 homosexual men with AIDS were compared with those of 29 symptom-free homosexual men. The object was to identify risk factors for developing AIDS.

Use of nitrite inhalants proved to be a highly significant risk factor for the development of AIDS. Further, the nitrite inhalants showed a "dose-response gradient": the heavier the nitrite usage, the greater the risk of developing AIDS. For the nitrite inhalants, the "odds ratio" (OR) increased from 4.0 for occasional users [once per 6 months to once per month] to 6.3 for frequent users [once per month or more often].

Other statistically significant (95% confidence level) odds ratios were found for cigarette smoking (OR = 3.4), marijuana use (OR = 3.7), frequenting bathhouses (OR = 7.6) prior syphilis (OR = 3.4), and fist-rectal sexual practices (OR = 3.5).

The authors compare their results with those of the other two case-control studies of homosexual men (Marmor 1982 and Jaffe 1983), and note that both of these also identified use of poppers as a risk factor for the development of AIDS. "We confirmed the finding of nitrite inhalation as a significant risk factor for KS/OI.... In the CDC study, lifetime use of nitrites was significantly greater among patients than for either of the control groups."

They comment:

"We believe there are several compelling reasons for considering nitrite inhalation a possible causal factor for development of AIDS and KS/OI. These are (a) volatile nitrites used as recreational drugs have been shown to be immu-

nosuppressive both in vitro and in vivo; (b) metabolic properties of N-nitroso compounds produce mutagens, teratogens, and carcinogens; (c) of 290 N-nitroso compounds tested, 252 (87%) are carcinogenic; (d) of 39 different animal species, none is known to be resistant; (e) N-nitroso compounds are among the most highly potent chemical carcinogens for animals; (f) their use is extremely common among male homosexuals; and (g) a definite dose-response relationship was shown by both Marmor et al. and us. The combination of cigarette smoking, marijuana use, and nitrite inhalation could predispose the lungs to opportunistic infections."

Nickerson, Mark; Parker, John O.; Lowry, Thomas P.; and Swenson, Edward W. "Isobutyl Nitrite and Related Compounds". 95 pages. Published by Pharmex, Ltd., 1978.

Known as the "Poppers Bible", this work was commissioned by the late W. Jay Freezer, chair of Pharmex, Ltd, the company that makes the popper brands Rush and Bolt, at a cost of \$200,000. It was instrumental in a decision by the California Department of Health to permit poppers to be sold free from regulation, testing, or control of any kind, provided they were advertised as "room odorizers" or "incense". As a piece of special pleading published by the poppers industry, the scientific value and credibility of this study are nil. Nevertheless, it is still cited by defenders of poppers.

The falseness of this report is revealed in the very first sentence:

"For the past several years there has been considerable controversy regarding the use of butyl nitrite in consumer products used for odorizing purposes." [Emphasis added.]

This is the task of the hired "experts" (each of whom has an MD degree): to lend credence to the claim that poppers are used as "room odorizers", and to determine whether or not they are safe when so used. Not surprisingly, given the underlying "room odorizer" premise and the interests of their patron, the authors conclude that the product studied (not referred to as "poppers") is quite safe. They enthusiastically fulfill their assignment:

"It is difficult to envision any product with a better record of public safety."

Appendix V, by Parker, is a study of the effects of ambient popper fumes upon workers in a poppers factory. In his Introduction, Parker begins by stating, "Butyl nitrite and isobutyl nitrite are employed in preparations intended for use as room odorizers." [Emphasis added.] Then, he states the purpose of his "study":

"This study was undertaken to ascertain whether the inhalation of isobutyl nitrite in concentrations far in excess of those encountered in its normal usage [emphasis added] would have any significant clinical, circulatory or hematological effects."

Through this verbal trickery, Parker has defined "normal usage" of poppers as being usage as a room odorizer. His conclusion 6 pages later is hardly unexpected: "This study has shown that inhalations of isobutyl nitrite, far in excess of those encountered during the normal use [emphasis added] of this agent, exert no harmful clinical, cardiovascular or hematological effects."

It is stated in the Preface, "This study took nearly two years to accomplish...." It seems odd that in two years of collaboration with Pharmex, Ltd., the

academics who wrote this study were not informed that Rush, Bolt, etc. are used as drugs, not as room odorizers. The 'room odorizer' claim is a lie, and the report as a whole is therefore a lie. These lies may have led to the deaths of many men.

Ortiz, Jesse S. and Rivera, Vilma L. "The Effect of Amyl Nitrite on T-Cell Function in Mice". (Presentation to the American Public Health Association Convention, November 1985)

Mice were exposed to amyl nitrite inhalation 5 days a week, for 21 weeks. A matched control group of mice was maintained in an identical environment, but was not exposed to amyl nitrite.

The main findings were:

1. In the mice exposed to amyl nitrite: "A decrease in mean body weight was found after accumulative exposure time of 8 weeks, and this decrease continued until the end of the experiment. After 21 weeks of exposure time both body weight and weight gain were significantly decreased ($p<0.2$; $p<0.01$)."

2. "Mice exposed to AN had extensive pathological damage to the lungs and this damage was statistically significant ($p<0.01$). The gross pathology observed in the lungs of the AN-exposed group consisted of: a) hemorrhagic spots, b) petechiae all over the lungs, c) collapsed consolidated sections which were red and showed the appearance of an emphysematous lung, and d) air pockets with large air bubbles.... It is therefore apparent that the chronic use of amyl nitrite may have profound pathological damage to the lungs."

3. Amyl nitrite inhalation caused a severe depletion of the helper T-cells, and consequently, an inverted T-cell helper/suppressor ratio. In the group of mice exposed to AN, the helper/-suppressor ratio was only 0.25, whereas in the control group it was 1.69 ($p<0.01$). A significant degree of correlation ($p<0.01$) was found between T-cell ratio and the independent variables (body weight and weight gain) in the exposed group, whereas in the control group, no significant degree of correlation between these variables was found, thus further confirming the causal relation between AN inhalation and the reversed helper/suppressor T-cell ratio.

"Our studies do show that chronic inhalation of AN can lead to an altered T-cell helper/suppressor ratio, the same phenomenon which occurs in AIDS victims. It does look, then, that there seems to be a link between AN inhalation and cellular immunity depression."

Osterloh, J. and Goldfield, D. "Butyl Nitrite Transformation In Vitro, Chemical Nitrosation reactions, and Mutagenesis". **Journal of Analytical Toxicology**, pp. 164-69, July/August 1984.

The authors studied "the transformation of n-butyl nitrite added to whole blood, plasma, and water, using anion exchange high pressure liquid chromatography, spectrometry, and gas chromatography".

They confirmed the findings of Quinto (which see) that butyl nitrite is mutagenic (and therefore likely to be carcinogenic as well).

Osterloh and Goldfield conclude:

"Chemical reactions indicate that nitrosation of amines is possible and mutagenicity studies have

been confirmed. Because these experiments indirectly suggest the potential in vivo nitrosation by butyl nitrite, the authors join Jørgensen and Lawesson in warning that use of alkyl nitrite may be hazardous and requires further study.'

Quagliarello, Vincent. "The Acquired Immunodeficiency Syndrome: Current Status". **Yale Journal of Biology and Medicine**, pp. 443-52, 1982.

This lead editorial reviews current research and theories, stressing the likelihood that amyl nitrite may be a causative factor, perhaps in conjunction with an infectious agent.

Quagliarello puts strong emphasis on the "drug hypothesis", making the point that all of the non-homosexual AIDS cases were drug abusers. He refers to studies of heroin addicts "demonstrating evidence for opiate receptors on lymphocytes in vitro, as well as depression of T-cell number and function in vivo opiate addicts."

Quinto, I. "The Mutagenicity of Alkylnitrites in the Salmonella test". (translation from the Italian) The Institute of Biological Chemistry, Faculty of Medicine, University of Naples. **Bulletino Società Italiana Biologia Sperimentale**, 1980, 56:816-20.

The effects of 5 forms of alkylnitrites on bacteria were studied, using "the Salmonella method, which is currently believed to be one of the best tests of mutagenesis".

Both amyl nitrite and isobutyl nitrite were found to be direct mutagens, "with or without metabolic activation". This finding is significant because:

"During the last 5 years, the problem of the correlation that exists between mutagenicity and carcinogenicity in chemical products has been studied with great attention. The results of the experiments obtained up till now (about 90% of chemical carcinogens are mutagens) have revealed that an actual correspondence exists between the two properties."

Quinto concludes by relating his findings to the abuse of nitrite inhalants in the U.S.:

"The originality of our experiment is the presentation of alkylnitrites as a new class of chemical mutagenic agents and the importance of stressing the oncogenous risk linked to the use and abuse of amyl nitrites and isobutyl nitrites. In particular, isobutyl nitrite has had a rapid and increasing diffusion as a drug on the American market during the past five years. In fact, in 1978, the companies manufacturing the chemical estimated that about five million Americans used their product. The accusation of mutagenicity of this compound urgently calls for a more thorough inquiry into the oncogenous risks to which millions of users of this drug may be exposed."

Romeril, K.R.; and Concannon, A.J. "Heinz Body Hemolytic Anaemia after Sniffing Volatile Nitrites". **The Medical Journal of Australia**, pp. 302-03, 21 March 1981.

The authors report on two separate cases in which young Australian men developed Heinz body hemolytic anemia (anemia characterized by excessive destruction of red blood cells). Each of the men had used amyl nitrite over the two days before being hospitalized, and had been regular users of the drug for at least 3 months, sometimes sniffing the drug up to 20 times per session. Each of them

would feel "tired and washed out" for several days after a sniffing episode.

Extensive tests ruled out other possible causes of the Heinz body hemolytic anemia. In both cases the men were warned of the dangers of amyl nitrite sniffing and were released from the hospital. Both men returned to the hospital after one month, during which time they had avoided the use of poppers; their blood was tested again: the anemic condition had gone away, and their red blood cell morphology was normal.

Sigell, Leonard T.; Kapp, Frederic T. et al. "Popping and Snorting Volatile Nitrites: a Current Fad for Getting High" **American Journal of Psychiatry**, pp. 1216-18, October 1978.

A valuable pre-AIDS history of volatile nitrite drug abuse, with insights into the business aspects.

"Common settings in which these agents are used include the bedroom, parties, backrooms of pornographic bookstores, pornographic theaters, bars, and dance floors. Some users have told us that a few discotheques use special lighting effects to indicate that they are about to spray nitrite fumes over the dance floor. [emphasis added]

"The snorting of volatile liquid nitrites for hedonistic purposes has created a large business estimated to total \$50 million a year. Sales have reportedly averaged 100,000 bottles a week in one city alone."

Sonnabend, Joseph; Witkin, Steven S.; Purtillo, David T. "Acquired Immunodeficiency Syndrome, Opportunistic Infections, and Malignancies in Male Homosexuals: A Hypothesis of Etiologic Factors in Pathogenesis".

Journal of the American Medical Association, pp. 2370, 6 May 1983.

This article, an influential statement of the 'multi-factorial hypothesis', takes issue with the prevailing view 'that a yet-to-be-identified virus causes AIDS'. The authors develop a model whereby 'Multiple factors, rather than a novel virus, probably induce AIDS'.

The main emphasis in this model is placed upon the exposure of 'a subset of men to the immunosuppressive impact of sperm and CMV'. However, various other potentially immunosuppressive co-factors are considered, including 'the recreational use of drugs'.

The important point is made that the etiology of AIDS in homosexual men may not be identical to the etiology of AIDS in other risk groups:

'We cannot, at this time, explain why AIDS is thought to be occurring in Haitians, hemophiliacs, and others. Acquired immunodeficiency has many causes, including malnutrition, hormonal alterations, use of opiates and other IV drugs, and acute viral infections.'

Walters, C.L. 'The Exposure of Humans to Nitrite'. **Oncology**, pp. 289-296, vol. 37 (1980).

This article does not deal with the nitrite inhalants, but rather nitrite in food and the environment in general. Nevertheless, it makes an important point relating the intensity of nitrite exposure to the carcinogenic potential. It seems the potential for formation of the deadly, carcinogenic N-nitroso compounds is much greater from a brief, high-level dosage (the situation involved in snorting poppers), than from a longer, low-dosage exposure.

'Since the rate of nitrosation of an amine is dependent on the nitrite concentration to a

power of greater than unity, it is probable that nitrite ingested in one application over a short period will be more active in the synthesis of N-nitroso compounds than a continuous supply at lower concentrations over long periods.'

Waterson, A.P. "Acquired Immune Deficiency Syndrome". **British Medical Journal**, pp. 743-46, 5 March 1983.

In evaluating theories on the etiology of AIDS, Waterson considers the most promising to be:

"Firstly, the 'hot bed' theory argues that the traffic in human material in certain quarters by abnormal routes has reached such a level that, combined with the effects of drug abuse of various kinds, the sheer weight of chemical and microbial insult to the body in general, and to T lymphocytes in particular, goes beyond the tolerable limit. Eventually irreparable damage is sustained, which becomes manifest clinically in one or other of the variety of components of the syndrome.

"Secondly, the drug theory points to drug abuse as the common denominator between the non-homosexuals and the main mass of patients. Much attention has focused on amyl and butyl nitrite as relative newcomers to the scene, but they are scarcely enough alone to cause all the damage."

Watson, E. Sue; Murphy, James C. "Use of Amyl Nitrite May Be Linked to Current Epidemic of Immunodeficiency Syndrome". Unpublished letter sent to the **Journal of the American Medical Association**, October 1982.

The authors report on an experiment which investigated the "effects of amyl nitrite on the primary humoral and cellular immune responses of mice".

"Groups of mice were exposed to a single capsule of amyl nitrite (Vaporole®, 0.3 ml capsule, Burroughs Wellcome®) in an 18 liter sealed container for 4 minutes, twice daily for 5 consecutive days beginning the day of immunization. The humoral immune response to sheep red blood cells was normal in mice exposed to amyl nitrite. However the cellular response to DNFB was reduced by 30-45% in mice exposed to amyl nitrite."

Dr. Watson also sent a letter to Robert McQueen , Editor of the **Advocate**, in which she stated:

"Our studies show that amyl nitrite strongly suppresses the segment of the immune system (cellular immunity) which normally protects individuals against Kaposi's sarcoma, Pneumocystis pneumonia, herpes virus, Candida, amebiasis, and a variety of other opportunistic infections. The upshot of this research is that persons using nitrite inhalants may be at risk for development of AIDS.... Publication of this letter in the Advocate will serve to alert the community to the health risks of using amyl nitrite. I hope you will see fit to include this information in the news section of the Advocate."

After receiving no response from the **Advocate**, Dr. Watson telephoned Editor McQueen. She was told, "We're not interested". It may be noted here that:

1. The **Advocate** was interested in AIDS, as several pages in every issue were devoted to this topic.

2. Since the **Advocate** is the world's largest gay paper, tens of thousands of gay men looked to it

for guidance on how they could reduce their risk of getting AIDS.

3. For years the poppers industry had been the **Advocate's** largest advertiser.⁴

⁴In a letter of 25 March 1983 (a copy of which is in the archives of the Committee to Monitor Poppers), to Peter Frisch of **The Advocate**, Joseph F. Miller, President of Great Lakes Products, Inc., urged **The Advocate** to publicize his press release, which claimed that CDC studies had exonerated poppers from any connection to AIDS. Miller was fully confident in the power of his advertising dollars:

'As the largest advertiser in the Gay press we intend to use the extensive ad space we purchase each month as the vehicle for sending a message of good health and wellness through nutrition and exercise to the North American Gay communities [sic].'

The Advocate then ran full-page advertisements for the Great Lakes brands of poppers; the series was called, 'Blueprint for Health'. The **Advocate's** health expert, Nathan Fain, whose credentials consisted of journalism experience covering the theater, wrote that poppers had been exonerated by a CDC study. Fain criticized researchers who warned about the dangers of poppers, attacked the New York **Native** for printing anti-popper editorials and news items, and ridiculed the City of San Francisco for banning poppers sales to minors and requiring warning signs to be posted at point of sale.

For more information on Miller's activities, see the section immediately following, 'The Poppers Industry and its Influence'.

III. THE POPPERS INDUSTRY AND ITS INFLUENCE

According to a 1978 study, the poppers industry was grossing \$50 million a year--a figure which may well have doubled or tripled since then. (Sigell 1978)

In a 1981 article⁵, Arthur Evans cited some disturbing aspects of the poppers industry. In 1978 a major poppers manufacturer, W. Jay Freezer⁶, hired "experts" (at a cost of \$200,000) to prepare a study⁷ which concluded that butyl nitrite products were safe "when used for odorizing purposes". On the basis of this impudently irrelevant study, the California Department of Health permitted poppers to be sold, free of any regulation, testing, or control, provided only that the products be advertised as "room odorizers or incense".

Evans charges:

"In fact, both the popper makers and the California Department of Health committed a criminal fraud. By hiding behind the lie that poppers are being used as a room odorizer or incense, they have completely circumvented the normal safety net of testing which every drug in this country must be subject to in order to be sold."

The point to be noted here is that the poppers industry can afford to spend large amounts of money in

⁵Evans, Arthur. "Poppers: An Ugly Side of Gay Business". *Coming Up!* November 1981.

⁶W. Jay Freezer died of complications due to AIDS on 27 March 1985. Freezer was not the first poppers manufacturer to die from AIDS. He was preceded by the New Yorker known as "Poppers Bill".

⁷See entry under Nickerson.

"influencing" research, government agencies, and public opinion, and was apparently quite successful with the California Department of Health.

A major campaign of "disinformation" commenced on 1 April 1983, when a press release was issued by Joseph F. Miller, "president of Great Lakes Products, Inc., the nation's largest manufacturer of nitrite-based odorants". It was entitled, "U.S. Government Studies Now Indicate that Nitrite-Odorants Not Related to AIDS!"

According to Miller, "the assistant director of the Center for Infectious Diseases (a part of the Centers for Disease Control in Atlanta), Dr. James Curran, invited him to Atlanta in late November of last year to discuss the work being done by CDC relative to its AIDS investigations". [If true, this meeting would be a very serious indiscretion on Curran's part, raising the possibility of collusion between the poppers industry and CDC officials.] According to Miller's press release, the CDC assured him that "no association exists between nitrite-based odorants and AIDS".

In a charming exercise of equivocation, Miller's press release states:

"Although his company does not advocate the misuse of HARDWARE® or QUICKSILVER® as inhalants, Miller says the company is greatly relieved to know that recent Government studies clearly show that such misuse poses no health hazard."

Six months later (27 September 1983) Dr. James Curran sent an angry letter to the poppers manufacturer, with a copy to the **Advocate** (which never printed it). Curran did not deny having met with Miller in Atlanta, but he objected strongly to some of his statements:

"Other health hazards from misuse of these drugs have been documented. Your press release and

advertisements in the **Advocate** are misleading and misrepresent the CDC findings and their implications.*

Curran's letter concludes:

"While it is unlikely that nitrites will be implicated as the primary [emphasis added] cause of AIDS, their role as a cofactor in some of the illnesses found in this syndrome has not been ruled out. I must insist that you discontinue the misuse and misinterpretation of CDC findings."

Comment: No study has ever been done, as of November 1982 or subsequently, that could reasonably be interpreted as "exonerating" poppers--as demonstrating, in the words of Miller's press release, that "no association exists between nitrite-based odorants and AIDS". The little **MMWR** news item (CDC 1983), which asserted an absence of "immunotoxic reactions" in mice exposed to popper fumes, was grossly misleading. When the study was finally reported on, two years later, it turned out that the mice had been exposed to low dosages intended to "mimic an occupational exposure setting" rather than the much higher dosages that would "imitate exposure by nitrite abusers". (Lewis 1985, Lynch 1985) No fewer than six other mice studies (Gangadharam 1985, Lotzová 1984, Maickel 1979, Neefe 1983, Ortiz 1985, Watson 1982) have demonstrated that exposure to amyl, butyl, or isobutyl nitrite is highly immunotoxic and otherwise harmful to mice.

The CDC weasels on poppers

For several years the Committee to Monitor Poppers has regularly sent copies of research to the CDC and other public health agencies. On 21 April 1985, Hank Wilson of the Committee to Monitor Poppers wrote a letter to Dr. James Curran, requesting that the CDC

assist in the formulation of risk reduction guidelines by issuing a statement condemning the use of poppers.

"There should be no question that popper use is quite extensive among gay males. Inhalant nitrites continue to be marketed and promoted to the gay male community as if they had no harmful health effects, nor any role in the development of AIDS."

"CDC should issue an alert to popper users. Popper users need to know that initial research indicates that poppers may be immunosuppressive. Users need to know that epidemiological research links poppers and KS. Users need to know that inhaling nitrites may result in cellular changes which make them vulnerable to an AIDS virus infection. A warning can be issued with the qualification that 'more research is needed', but the least CDC can do is to alert the popper users about what is already known. Better to err on the side of caution than to say nothing."

Curran responded with a most evasive letter:

May 6, 1985

Dear Mr. Wilson:

Thank you for your letter of April 21 and the enclosures.

Some of the studies you cite are outdated and some are quite current. You have edited and amalgamated them skillfully. The data presented by Haverkos and Moss and their respective collaborators at the recent International Conference on AIDS are intriguing and deserving of further attention. The issues they raised warrant further investigation into the whole field of cofactors and their role in AIDS causation. It is possible that heavy use of

nitrites, or another factor correlated with such use, may contribute in some as yet undefined way to the development of Kaposi's sarcoma in those already infected with HTLV-III or who have AIDS.

I agree that this information should be disseminated and I acknowledge the active role you have played in this effort. On the other hand, the present data do not justify an absolute "anti-popper" campaign.

We certainly wish to point out that no data exist to indicate that using nitrites is a safe, risk-free practice. Gay men should consider decreasing use of this substance until more data are available to assess those risks that may exist.

Thank you for your interest in this issue.

Sincerely yours,
James W. Curran, M.D., M.P.H.
Chief, AIDS Branch
Division of Viral Diseases
Center for Infectious Diseases

Some comments on the Curran letter: What does it mean to say, "Some of the studies you cite are outdated"? Which studies? And how so?--because they have been a) superceded by better studies?, or b) contradicted by later studies? At any rate, what about the really important studies, any one of which provides a reasonable warrant for banning poppers now, not just issuing warnings about them. Why does Curran refuse to address himself to a single specific issue? And what does Curran mean, "the present data do not justify an absolute 'anti-popper' campaign"? Would it be an "absolute 'anti-popper' campaign" to come right out and say "Don't use poppers", or "Poppers are harmful to the health", or "Poppers are a risk factor for AIDS"? There is plenty of information right now to

take a stand on poppers, and no excuse for weaseling on the issue.

Curran's statement, "Gay men should consider decreasing use of this substance until more data are available to assess those risks that may exist", is preposterous. Gay men should not "consider" anything at this point; they should act. And they should stop using poppers, not just decrease the use of them.

Setbacks for the poppers industry

In Wisconsin last year, the poppers industry, under the leadership of Joseph Miller, waged an all-out battle to prevent poppers from being banned. A formidable legal brief was prepared, which sanctimoniously adhered to the "room odorizer" tack. ("Those who denigrate the room odorizer effect of Great Lakes' products...are actually expressing nothing more than their personal distaste for the butyl nitrite odor.")

Paid experts were flown in to testify as to the harmlessness of poppers, including the Professor of Medicine, John Parker, a co-author of the "Poppers Bible".⁸

Another expert witness for Great Lakes Products, Inc. was Bruce Voeller, a founder and former Co-Director of the National Gay Task Force. According to a Wisconsin paper, "Voeller said all studies linking AIDS and butyl nitrite were 'utterly flawed and without foundation'". Another paper noted dryly that Voeller's "expenses for appearing at the hearing were paid by a butyl nitrite manufacturer".

The legislators were not favorably impressed by the

⁸See entry under Nickerson.

"expert" testimony, and poppers are now a "banned hazardous substance" in Wisconsin.

In California, both San Francisco and Los Angeles have moved to ban the use of poppers in public, and to require point-of-sale warnings that their use is linked to the development of AIDS. In testifying in Los Angeles, Joseph Miller took several steps backwards:

"We recognize that the nitrites can be misused as inhalants. We have a responsibility for consumers; that's why we have warning labels that they should not be inhaled." [Emphasis added.]

If poppers continue to be sold legally, this is due in part to disinformation from the poppers industry, disinformation which undoubtedly lies behind the striking disparity between current medical knowledge regarding the nitrite inhalants, as reported in the best medical journals, and the near-blackout on such information in the popular press and much of the gay press.

Government regulatory agencies have behaved shamefully in accepting the "room odorizer" lie. ("The makers have done their homework", said Edward Nida, an FDA spokesman, "there's not a damn thing we can do about it.") This is utter madness. Everyone knows that poppers are inhaled as a drug. Everyone who has studied the issue knows that poppers are dangerous, and almost certainly implicated in the etiology of AIDS. And yet the popper profits continue to roll in, and gay men continue to die.

As long as public officials refuse to do their duty, it is up to each of us individually to spread the word about the dangers of using poppers.

Critical judgment is called for. The bottom line is:

DO NOT USE POPPERS!

APPENDIX A: Koch's Postulates: The Case Against
LAV/HTLV-III's Being the Sole, Sufficient, or
Necessary Cause of AIDS

In medical science, the standards for proving that a particular micro-organism causes a disease are three classic laws known as "Koch's Postulates". So far, the so-called "AIDS virus" (LAV or HTLV-III), has ignominiously failed to fulfill even one of the bacteriologist Dr. Robert Koch's three laws for "establishing the specificity of a pathogenic micro-organism".

Koch's first Postulate requires that the microbe be found in all cases of the disease. In various samplings of AIDS patients, anywhere from 20% to 64% do not have the LAV virus, and about 10% do not even have antibodies. CDC officials cavalierly attribute this awkward finding to "poor testing methods", failing to acknowledge that the burden of proof is on those who claim that the "AIDS virus" is the cause of AIDS.

Koch's second Postulate requires injection of the micro-organism into susceptible animals, with the result that the same disease is produced. For years researchers have been injecting several species of monkeys with fluids from people with AIDS. Whatever microbes were in the blood of the AIDS patients--whether viruses, bacteria, or other--whether named LAV or HTLV-III or ARV or something else--these microbes would have been transmitted, in large quantities, to the blood of the monkeys. And none of the monkeys has yet developed AIDS. Further, there have been several hundred carefully monitored cases of health care workers who accidentally stuck themselves with needles that had been used on AIDS patients. In no case has AIDS resulted from one of these inoculations.

The third Postulate requires that the agent create the disease upon transfer from animals made ill by inocula-

tion. Obviously this condition has not been met, as no animal has yet been made ill by inoculation.

It is certainly possible that the LAV virus may play some role, perhaps even an important role, in causing AIDS. However, LAV clearly cannot be regarded as a necessary factor in causing AIDS if substantial proportions of AIDS patients do not have the virus. This is the inescapable logic of Koch's first Postulate.

Considering that up to two-thirds of the AIDS patients do not have the virus in their bodies, one may question the wisdom of treating these patients with toxic and experimental antiviral drugs, such as ribavirin, which at best may prevent the virus from replicating. If the virus is not present in the patient's body, there is nothing to prevent from replicating.

The government's insistence that the "HTLV-III" virus is the cause of AIDS, sole and sufficient, has stifled independent research and thinking, and has dangerously misled people as to the risk-factors for AIDS. Intravenous drug users have not been told to quit using drugs, only that they must stop "sharing needles". (Actually, there is no evidence that all, or even most, of the IV drug users with AIDS did "share needles".) Gay men have been told that they must restrict their sexual activities, but not that they ought to stop using cocaine, heroin, quaaludes, amphetamines, ethyl chloride, PCP, marijuana, LSD, barbiturates, poppers, and the other "recreational drugs" (a sick euphemism) that are prominent in the lifestyle of many gay men.

The government's unreasoning dogmatism is well expressed in Robert Gallo's statement: "If you get run over by a truck, you don't need co-factors." The "AIDS virus" is hardly a truck, and it may be the "co-factors" that cause AIDS.

APPENDIX B: A TOXICOLOGIC MODEL

The "AIDS virus" etiology has been put forward thousands of times in the media, complete with color fluorescence micrograph photographs, and the public has come to believe it. Nevertheless, the "virus only" theory is not tenable. Repeating a hypothesis does not verify it. Propaganda is not science.

Any theory of how AIDS is caused must come to grips with the fact that for five years AIDS, unlike a truly communicable disease, has remained compartmentalized. More than nine out of ten AIDS cases are either intravenous drug users⁹ or homosexual/bisexual men.

Medical science recognizes that illnesses can have infectious causes, or non-infectious causes, or both types of causes acting together. Some illnesses are caused primarily by communicable microbes. Others--like radiation-induced leukemia, black lung disease,

⁹The CDC reports AIDS statistics by using a 'hierarchical presentation'. Data on "AIDS cases by Patient Characteristics" are reported by listing the largest category (homosexual men) first, after which a patient is included in a subsequent risk group only if he has not already been counted. A gay man who uses IV drugs is a homosexual, but not an IV-drug user.

CDC tables show 17% of AIDS cases as being IV-drug users, with no indication that these 17% are only the exclusively heterosexual IV-drug users. They conceal the substantial overlap group: gay men who are also IV drug users. In fact, anywhere from 26% to 34% of the total AIDS cases are IV-drug users.

The effect of the CDC's statistical trickery is to underreport IV-drug users as an AIDS risk group by at least 50%; the effect is to construe AIDS as a venereal disease, rather than a drug-induced condition.

alcoholic cirrhosis of the liver, emphysema from cigarette smoking, or the dioxin ("Agent Orange") syndrome of diseases—are caused by toxins.

For reasons unknown, the U.S. Public Health Service adheres with military rigidity to the line that AIDS must be explained in terms of the "AIDS virus", and that research efforts must be based solely on this premise. Risk-reduction measures are to be predicated solely on preventing transmission of the putative virus.

Government officials have taken an adversary stance against the possibility that toxic agents play a role in causing AIDS. They have, for example, laid down the line that IV-drug users develop AIDS, not from the drugs they use, but from allegedly "shared needles", an unproved assumption. Considering that heroin is known to be immunosuppressive, and specifically to cause depression of T-cells, the government's intransigent dismissal of the drugs, while focussing on "shared needles", is bizarre and irresponsible. It is truly a case of "straining at a gnat and swallowing a camel".

In actuality, such epidemiological information as we have seems more consistent with a toxicologic than with the prevailing microbial model. To illustrate another way of looking at AIDS, we have developed the accompanying diagram, in which toxins represent the primary causative factor. By no means a finished explanation of how AIDS is caused, the model is intended to portray possible relationships, to generate hypotheses and provide directions for research.

Everything in the diagram is part of the typical AID Syndrome, though the exact relationships involved, or the relative importance of the various components, remain to be determined. Some factors may be relatively trivial, while others may be crucial. In the center are various toxins, some peculiar to the life-

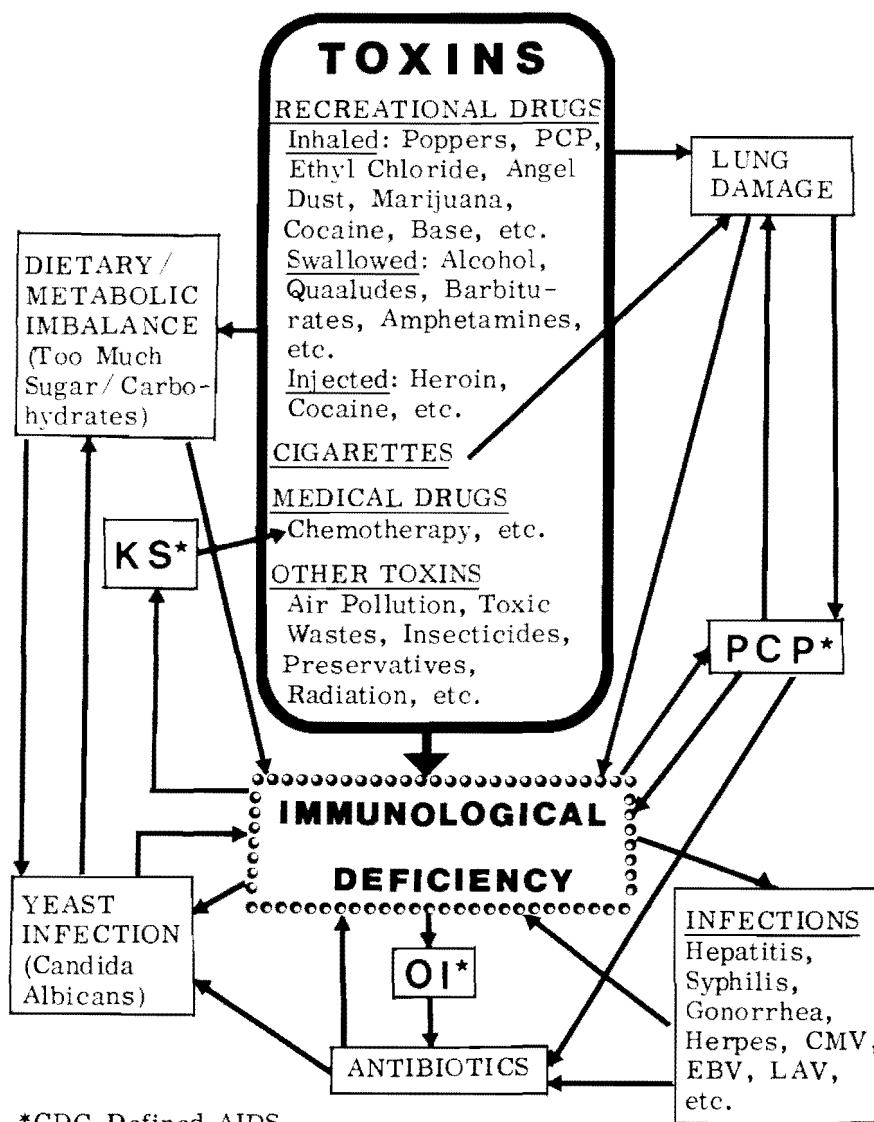
styles of IV-drug users and/or urban gay men, others affecting much of the population. The model is multi-factorial, for disease, like health, is multifactorial. However, one should bear in mind that some drugs are capable of causing AIDS all by themselves.

Several vicious circles are in operation, for example, "Dietary/Metabolic Imbalance", a condition caused by many different drugs. There are addicts who seem to live on nothing but candy bars and sugar water. When the carbohydrate diet is joined to an impaired immunological system and the use of antibiotics (like tetracycline), a yeast infection ("thrush") commonly develops, which further depresses immunological functioning and creates even greater craving for carbohydrates.

In another vicious circle, the inhaled "recreational" drugs cause lung damage (Newell 1985, Ortiz 1985), which depresses the immune system (of which the lungs are a crucial component) and prepares the way for pneumocystis carinii pneumonia, which further impairs the immune system, damages the lungs, and requires antibiotics, which themselves aggravate the condition.

Much research needs to be done, as there is amazingly little information on the characteristics of people with AIDS. To begin with we need studies of large, representative samples of AIDS patients--information on their diets, before and after diagnosis; their drug habits in detail, including combinations, amounts, and frequency of use; cigarette smoking; infectious disease histories; medical drug histories, with special attention to antibiotics. Were there many PWA's in good health prior to developing AIDS?--who had not smoked cigarettes, used drugs, drunk excessively, or had a history of venereal infections with antibiotic treatment?--who had followed a well-balanced diet? The "virus only" theory ("you don't need co-factors") would imply many such people; the toxicologic model, very few.

ETOIOLOGY OF AIDS: A TOXICOLOGIC MODEL



APPENDIX C: Occam's Razor: The Drugs Connection

Nowhere have we argued that poppers are the cause of AIDS. Obviously poppers are not, as there are AIDS patients who have never used them. At the same time, the "AIDS virus" (LAV or HTLV-III) cannot be the cause either, as substantial numbers of AIDS patients do not have the virus in their bodies, and yet remain sick. To be honest one must say that the cause of AIDS is unknown. There may be more than one route to AIDS, or it may be that multiple factors in combination are required to cause the condition.

Science generally prefers the "most parsimonious" explanation that accounts for the facts. The principle was formulated by the 14th-century philosopher, William of Occam, whose Razor states, "What can be done with fewer [assumptions] is done in vain with more."

Certain drugs, such as the medications used during transplant operations, can cause the AIDS condition, immune deficiency, all by themselves. It is also known that "recreational" drugs, like heroin, are immunosuppressive. And it is now firmly established that poppers are immunosuppressive. More than a quarter of the AIDS cases have occurred among intravenous drug users, and most of the remaining AIDS cases have occurred among gay men who used poppers (as well as other "recreational" drugs).

When injectors of immunosuppressive heroin, or inhalers of immunosuppressive poppers, develop AIDS, Occam's Razor suggests parsimoniously assuming that their drugs were the cause. Microbes, diet, and other lifestyle and environmental factors probably played a role, but these represent superfluous assumptions.

In any event, common sense dictates not using immunosuppressive drugs. **Do not use poppers.**

THE POPPERS STORY

"Poppers", a drug which has been prominent in the gay male lifestyle since 1972, are a liquid mixture of isobutyl nitrite and other chemicals, packaged in small bottles under such names as "Rush", "Ram", "Locker Room", "Bolt", and "Crypt Tonight". When inhaled just before orgasm, poppers seem to enhance and prolong the sensation. In time, they become addictive, a sexual crutch.

Poppers are a dangerous drug: known to cause immune deficiency, anemia, strokes, and lung damage, and suspected of causing cancer. Many independent researchers have warned that poppers are a major risk factor for the Acquired Immune Deficiency Syndrome (AIDS).

Since 1981 the San Francisco-based Committee to Monitor Poppers has been collecting literature on the nitrite inhalants. Its archives have provided the core of this book: a critically annotated 34-page Bibliography of reports from medical journals and other publications. From experiments on mice, from laboratory and epidemiological studies, the evidence powerfully mounts that poppers are hazardous to the health, and causing gay men to develop AIDS.

Notwithstanding their toxicity, poppers have been sold legally in almost every state. The poppers industry, grossing upwards of \$50 million a year, has successfully evaded testing or regulation of any kind by claiming that poppers are really a "room odorizer" or "incense".

The poppers story is an ugly one, involving outwardly respectable academics who furnished the poppers industry with fraudulent research—government officials who used statistical trickery to mislead the public—government scientists guilty of incompetence and blind obstinacy—gay leaders who testified for the poppers industry—gay publishers who valued advertising dollars more than the lives of gay men.

The book ends with an analysis of the "AIDS virus" hypothesis, concluding that LAV (or HTLV-III) cannot possibly be the cause of AIDS. A toxicologic explanation is put forward as plausible: that gay men and intravenous drug users are developing AIDS because they are being poisoned, presumably by the drugs they are using.