

Introduction

by David Presti, Ph.D. and Ross West

A GRAND EXHIBITION OF THE EFFECTS PRODUCED BY INHALING NITROUS OXIDE, EXHILERATING, OR LAUGHING GAS! WILL BE GIVEN AT *The Masonic Hall*

Wednesday EVENING, 15th 1845.

50 GALLONS OF GAS will be prepared and administered to all in the audience who desire to inhale it.

MEN will be invited from the audience, to protect those under the influence of the Gas from injuring themselves or others. This course is adopted that no apprehension of danger may be entertained. Probably no one will attempt to fight.

THE EFFECT OF THE GAS is to make those who inhale it, either

LAUGH, SING, DANCE, SPEAK OR FIGHT, &c. &c.

according to the leading trait of their character. They seem to retain consciousness enough not to say or do that which they would have occasion to regret.

N. B. The Gas will be administered only to gentlemen of the first respectability. The object is to make the entertainment in every respect, a genteel affair.

Those who inhale the Gas once, are always anxious to inhale it the second time. There is not an exception to this rule.

No language can describe the delightful sensation produced. Robert Southey, (poet) once said that "the atmosphere of the highest of all possible heavens must be composed of this Gas."

For a full account of the effect produced upon some of the most distinguished men of Europe, see Hooper's Medical Dictionary, under the head of Nitrogen.

Nitrous oxide (N_2O) is an amazing molecule. When compared to other psychoactive compounds – such as LSD, psilocybin, mescaline, and MDMA – which have relatively complex molecular structures consisting of many atoms, the N_2O molecule is remarkable for its three-atom simplicity. Though the mechanism of how nitrous oxide affects the human brain at the cellular and molecular levels is poorly understood, the effects themselves have been thoroughly examined. Nitrous oxide (also called laughing gas) is known to produce states of analgesia (relief from pain) and anesthesia (loss of bodily sensation), properties which have fostered its longtime use as a surgical anesthetic. More to the point of this book, the versatile gas can also bring about states of profoundly altered consciousness.

The discovery of N_2O is generally attributed to Joseph Priestley, scientist, clergyman, religious scholar, and political liberal, who in 1772 reported the isolation of a mixture of nitrogen oxides (including N_2O) which he christened "Dephlogisticated Nitrous Air." Around the same time, the sagacious Priestley, no slouch in the laboratory, also discovered oxygen, nitrogen and ammonia – and an effective way of producing carbonated water by dissolving carbon-dioxide gas in water. Although a golden age of research into gasses was at hand and Priestley was playing an important role in the history of science, his neighbors failed to honor their local luminary. Angry over his political leanings, they formed a mob and burned down his house, his church, and his laboratory in 1791, forcing him to flee the vicinity and later to depart England for America.

But even a mob's torches could not frighten the genie back into the lamp. Less than a decade passed before the Pneumatic Institution, a small medical facility, was established in Bristol,

from "Laughing Gas - Nitrous Oxide"
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England. Here, research into the mind-altering qualities of nitrous oxide was first conducted by a group of pioneering self-experimenters under the leadership of physician, scientist, and poet Thomas Beddoes. His colleagues included Humphrey Davy (a brilliant young chemist, who would go on to discover the elements of sodium, potassium, and boron) and Davy's friend Peter Mark Roget (a young physician who, years later, would compile the still-famous *Roget's Thesaurus*).

These were the days of so-called pneumatic medicine – the experimental treatment of various ailments by the inhalation of gasses – and the Pneumatic Institution was at this discipline's center. The Institution also became a kind of Mecca for inner-adventurers, who, keep in mind, were living in a time and place where opium was generally available from the local apothecary as an over-the-counter medicine. Davy found that, when measured against “high intoxication from opium or alcohol,” nitrous oxide could produce “an excitement equal in duration and superior in intensity.”

A careful observer, Davy was the first to appreciate the analgesic properties of nitrous oxide. Between working with the “patients” who came to the Institution to be treated and heavily dosing themselves, the Institution staff compiled a wealth of data on the effects of nitrous oxide that remains of interest today. Many of these observations were brought together by Davy in a 580-page treatise (*Researches, Chemical and Philosophical; Chiefly Concerning Nitrous Oxide, or Dephlogisticated Nitrous Air, and its Respiration*) which he published in 1800 at the age of 21. This immediately established his reputation in the scientific community and he was invited to lecture at the Royal Institution in London. Three years later he was elected a Fellow of the prestigious Royal Society.

In the next major scene in the nitrous-oxide drama, the actors are no longer the intellectual elite of England. Enter instead the side-show entertainers and itinerant lecturers who traveled the American landscape in the 1840s. Their performances demonstrated the wonders of the intoxicant that had come to be called “laughing gas,” because those who inhaled it frequently became

uninhibited and jovial. A handbill for such an exhibition is reproduced as a frontispiece to this book – one can hardly read it without hearing the huckster-incarnate voice of W.C. Fields imploring hayseeds and suckers to “step right up.”

Among the checkered group of entertainer-educators who traveled the snake-oil circuit was Gardner Q. Colton. During one of Colton's performances, a volunteer inhaled a quantity of the gas, began to gyrate, then vigorously rammed his shin into a heavy piece of furniture. Seemingly unaware of the damage done, the dancer continued romping about the stage until, as normal consciousness returned, he became painfully aware of his throbbing leg. Watching this scene from the audience was a young man named Horace Wells. It was a fortuitous observation, but “chance favors the prepared mind”, as Louis Pasteur would later articulate. As a dentist in the medically primitive days of the 19th century, Wells was only too familiar with pain. The prospect of helping his patients undergo tooth extractions and other harrowing procedures with less agony spurred Wells to successfully experiment, assisted by Colton, with nitrous-oxide-aided dentistry. Wells thus became a pioneer of surgical anesthesia.

Unfortunately, Wells' success was short-lived and his promising life soon slid to hell on greased rails. He became a regular abuser of nitrous oxide, and then moved on to ether and chloroform. Finally, after a chloroform-addled attack on some prostitutes, he was jailed and shortly thereafter committed suicide.

His former partner fared much better, however. As an old side-show man, Colton knew a good thing when he saw it, and the memories of watching Wells perform relatively painless, gas-aided surgeries had never left him. In the 1860s he returned to the game of anesthesiology, and with the help of the gas and a partner, went on to perform thousands of tooth extractions.

Today, one hundred and thirty years later, nitrous oxide remains a commonly used dental anesthetic.

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The nitrous-oxide state, in addition to the analgesic and anesthetic properties so useful in dentistry and surgical medicine,

has qualities in common with psychedelic states. As is embodied in the word itself (psychedelic means “mind manifesting”), these states are characterized by an increased depth, intensity, and expansion of thought and feeling. Although progress has been made in the description of the tranquilization, anesthesia, analgesia, stimulation, and euphoria brought on by various psychoactive chemicals, the altered states induced by *psychedelic* molecules remain poorly characterized. In fact, the scientific literature has little to say about these properties of nitrous oxide. This is not to say, however, that these properties have been completely overlooked.

The writings of the pioneer psychologist, philosopher, and physician William James still stand prominently in this area. James appreciated, from his own experiments, the power of the unusual altered state of consciousness induced by the gas. He first described his experiences in conjunction with a paper on the philosophy of Hegel, published in the journal *Mind* in 1882. In attempting to make sense of Hegel’s ideas, James struggled with the German philosopher’s claim that opposites can be united in a “higher synthesis.” In his lengthy and thoughtful *Mind* article, James arrived at the conclusion that he could not be a Hegelian because the idea of unification of opposites was to him an irresolvable conundrum, comparable to having one’s cake and eating it too.

After completing his article, James was introduced to nitrous oxide. Under its influence, he experienced insights into Hegel’s philosophy which led him to compose a short note (reprinted in this book) which appeared as an addendum to his article in *Mind*. There he wrote how the gas had helped him realize that “there are no differences but differences of degree between different degrees of difference and no difference.” His rhapsodizing didn’t stop there. Some of his other gas-induced exclamations included: “good and evil reconciled in a laugh!” and “sober, drunk, all the same!” Clearly, nitrous oxide had allowed James to glimpse the notion, central to Buddhist and Taoist philosophy, as well as a component of Hegel’s, that contradictory notions could indeed be simultaneously acceptable. Forty-some years later, the same

notion would emerge as an important aspect of modern physics in the theory of quantum mechanics.

James referred again to his experiences with nitrous oxide in his classic work *The Varieties of Religious Experience*, the text of the Gifford Lectures on Natural Philosophy and Religion delivered to the University of Edinburgh in 1901-1902 – a lectureship which continues to this day to attract great thinkers in the tradition of natural philosophy.

One conclusion was forced upon my mind at the time [of inhaling nitrous oxide], and my impression of its truth has since remained unshaken. It is that our normal waking consciousness, rational consciousness as we call it, is but one special type of consciousness, while all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence; but apply the requisite stimulus, and at a touch they are there in all their completeness, definite types of mentality which probably somewhere have their application and adaptation. No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded. How to regard them is the question....

Nearly a century later, we continue to wrestle with this question of how to regard certain altered states of consciousness. The debate is unarguably complex and is made even more difficult because the very description of the states in question has proven a daunting task. Indeed, one of the frequently mentioned characteristics of altered states of the mystical stripe (which, it is contended, nitrous oxide can induce) is *ineffability*. A large percentage of psychedelic travellers claim that language is inadequate to communicate the experiences through which they journey.

This claim was reconfirmed by the intrepid members of the East Bay Chemical Philosophy Symposium (EBCPS), modern bearers of the torch ignited by Davy, who, in the present book, report on their extensive experience with nitrous oxide. One

EBCPS member commented: "We've taken tape recorders into rooms and tried to speak into them and free associate and tell what was coming into our heads on gas and we found it couldn't be verbalized."

Nearly two centuries ago, Peter Roget articulated his experience by saying: "My ideas succeeded one another with extreme rapidity, thoughts rushed like a torrent through my mind, as if their velocity had been suddenly accelerated by the bursting of a barrier which had before retained them in their natural and equable course."

Humphrey Davy described the effects of one gas-guzzling session this way: "I lost all connection with external things; trains of vivid visible images rapidly passed through my mind, and were connected with words in such a manner as to produce perceptions perfectly novel. I existed in a world of newly connected and newly modified ideas."

James characterizes the central attraction of the gas as follows: "With me, as with every person of whom I have heard, the keynote of the experience is the tremendously exciting sense of an intense metaphysical illumination. Truth lies open to the view in depth beneath depth of almost blinding evidence. The mind sees all the logical relations of being with an apparent subtlety and instantaneity to which its normal consciousness offers no parallel."

The sharp-minded reader may note that for all the dizzying verbiage and fanfare, the experience remains vaguely described. What was so amazing about it? What were these perfectly novel perceptions, these newly connected ideas, these blinding metaphysical insights? And why don't the writers let us in on them?

James explains the difficulty as a curious function of the gas experience itself: "as sobriety returns, the feeling of insight fades and one is left staring vacantly at a few disjointed words and phrases [written during the intoxication], as one stares at a cadaverous-looking snowpeak from which the sunset glow has just fled, or at the black cinder left by the extinguished brand."

The insights made available by the gas are "truths that lie open in depth beneath depth of almost blinding evidence" and moments later "disjointed words and phrases." Surely this is the

most perplexing, maddening, and paradoxical aspect of the nitrous-oxide experience. What are we to make, for example, of this lightning bolt of insight, penned by James under the influence of laughing gas: "By George, nothing but othing!"

It seems that the characteristic ineffability of altered states in general is further complicated for nitrous oxide by an apparent inability, in many cases, for users to remember insights gained under its influence. *Transience* is again and again reported as a prominent feature of the experience. It is as if the gas helps to pull back that filmiest of screens, but only for a moment, and at a cost of at least partial amnesia.

These extraordinary states of consciousness provide a rich and fascinating area for scientific study. Within the world of the known psychedelic compounds and their effects (aspects of the N₂O experience here included) lies a wealth of information about the neurochemistry of processes which underlie some of the most magnificent aspects of the human brain: psychological defense mechanisms, attentional processes, memory, and creativity among them. And while we work to understand how more chemically complex psychoactive compounds might interact with neurotransmitter-receptor systems by virtue of molecular similarity with brain neurotransmitters, N₂O remains a puzzle. Does it interact with a specific neurotransmitter receptor? Does it interact with other, non-receptor components of the nervous system, such as membranes or intracellular, second-messenger systems? Does it have a widespread effect on many receptors, by virtue of its being some sort of small and versatile "master key"? In so many ways the brain remains a black box of mysterious chemistry, and psychoactive compounds may contribute to valuable additions to the understanding of the riches and mysteries – neurochemical and psychological – within us all.

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Lest one think that every inhalation of N₂O produces a mind-expanding, psychedelic-like altered state, reports by some individuals emphasize merely a feeling of faintness. Others stress

the rapid onset (“rush”) of numbed consciousness, and some refer predominantly to a throbbing enhancement of auditory perception – making listening to Led Zeppelin, perhaps, a “superheavy vibratory” experience.

Contemporary recreational users of nitrous oxide generally obtain the gas in one of a few ways. Tanks of N_2O occasionally get diverted from supply warehouses, hospitals, and dental offices into the homes of recreational users. Another widespread commercial use of nitrous oxide is as propellant for whipping cream. Small quantities of the gas can be obtained from cans of whipped cream sold in grocery stores. Cartridges of N_2O , called whippets and manufactured for use in pressurizing whipped cream dispensers used by restaurants, are another frequent source of nitrous oxide for recreational use. The user inhales the gas from a balloon inflated with the contents of the cartridge.

Occasionally, following in the footsteps of Priestley and Davy, individuals attempt to synthesize N_2O . This is definitely not recommended, for several reasons. First, the synthetic process frequently employed (heating ammonium nitrate) may lead to an explosion, and has been the cause of major accidents and numerous injuries in the industrial synthesis of N_2O . Second, other oxides of nitrogen may be obtained as byproducts of the synthetic process. One of these, nitrogen dioxide, is extremely toxic, and can lead to rapid destruction of lung tissue, even if inhaled in small quantities.

When the first edition of this book was printed in 1973, laughing gas seemed almost miraculous in its ability to drastically alter consciousness while inflicting on the user virtually no deleterious side effects. Although recreational users sometimes suffocate themselves by failing to breathe adequate amounts of oxygen along with the nitrous oxide, it has been widely believed that when used with sufficient oxygen, nitrous oxide is safe and harmless.

However, beginning in the late 1970s, evidence has been gathered that tempers this benign assessment, for use of nitrous oxide can give rise to several potentially serious problems. The major potential medical complication associated with whiffing laughing gas is known as peripheral neuropathy, the degeneration

of nerve fibers controlling sensation and movement in the arms and legs. The first symptom of this kind of trouble is generally a persistent tingling and/or numbness in the fingers and toes, which sometimes develops into a disorder severe enough to require assistance when walking. Other problems associated with prolonged nitrous-oxide use include impotence, impairments of memory and other aspects of mental functioning, and decreased ability of bone marrow to produce white blood cells. These toxic effects have led to the questioning of the widespread use of nitrous oxide as a surgical and dental anesthetic. Although many of the reported cases of neuropathy have involved individuals who had inhaled N_2O many times over periods of several years, some cases occurred after as little as three months of one-to-two recreational inhalations per week. While most of these persons gradually recovered after use was terminated, it also appears that some of the nerve damage suffered may be permanent.

Interestingly, Humphrey Davy had noted that heavy consumption of nitrous oxide produced in him symptoms of distorted sensibility in his fingers, as well as difficulties with sleep, concentration, and mood. He also found that the gas could lead to a kind of psychological dependence; that is, a desire to use the gas was frequently triggered in him by the mere sight of another person breathing it, or even by the sight of the associated 18th-century paraphernalia involved in N_2O use.

Thus we are reminded that one aspect of chemicals which alter consciousness is their potential for abuse, that is, continued use despite adverse effects on one’s life. In addition to serious side-effects such as neuropathy, any substance which alters consciousness in a way that relieves anxiety or otherwise increases pleasure carries with it, *ipso facto*, the potential for overuse. Psychoactive substances are best respected for the powerful effects they may have on both the psyche *and* the physiology of users. With nitrous oxide, as with other drugs, education concerning these effects is key.

Deleterious side-effects notwithstanding, there will always be self-experimenters who choose to “Just Say N_2O ” rather than “Just Say NO.” Indeed, reports by such individuals contribute to

our understanding of the effects of nitrous oxide on the human nervous system, complementing laboratory investigations of the physiological and neurochemical effects.

And thus it is that books like this one make an important contribution. It is disturbing, then, that we are living at a time in which new laws and new interpretations of old laws are posing a threat to the availability of such writings. We once had a brush with this sort of censorship in obtaining an earlier edition of *Laughing Gas – Nitrous Oxide*. We had seen the book in the small, but usually well-stocked, “Drugs” section of a favorite second-hand book store, but had passed over purchasing it. Several weeks later, we returned to the store, hoping to obtain the book, as the idea that it was an out-of-print classic had finally percolated into consciousness. However, not only was the book no longer there, but the entire “Drugs” section had disappeared. Puzzled, we approached the store’s owner, who indicated that with the recent introduction of a more restrictive drug-paraphernalia law, she had pulled all the books on recreational drug use from the shelves, out of fear of being busted under some global interpretation of the law. Fortunately, the book still remained in the back room, and we were able to purchase it.

With unrestricted reading threatened in this way, the role of And/Or Press in keeping books like this one in print becomes an increasingly valuable one.

Laughing Gas

(Nitrous Oxide)



Early method of administering Nitrous oxide