

Nutmeg as a Psychoactive Drug

ANDREW T. WEIL

Harvard Medical School, Boston, Massachusetts

Clearly, nutmeg is unique among the less familiar psychoactive drugs. It is the only one widely known to millions of persons in all countries—albeit for other-than-pharmacological purposes. It is also the only one whose use as a drug may be on the verge of an enormous increase. The aim of this paper is to review the botany, history, and commerce of nutmeg as well as to describe the ways it is used for effects on consciousness.

Two spices—nutmeg and mace—come from the nutmeg tree, *Myristica fragrans* (family Myristicaceae), a handsome tropical tree native to the Banda Islands and other islands of the East Indian archipelago. The genus *Myristica* comprises about 100 species found throughout the torrid zone, especially in the Malayan region; but of these *M. fragrans* alone contains enough of an aromatic essential oil to make it worthy of cultivation. Usually 30 or 40 feet tall, the nutmeg tree has a dark gray bark, spreading branches, and alternate, oblong-ovate leaves that are four inches long, leathery, and glossy green. Normally, the species is dioecious. Flowers, male and female, look like those of the lily-of-the-valley; they are pale yellow, fleshy, and have a strong scent of nutmeg. The fruit is a pendulous, fleshy drupe resembling an apricot (1,2,3).

When ripe, the fleshy husk, or pericarp, of this fruit splits open into two halves, revealing a shiny brown seedcoat, or testa. Inside this shell is the seed, which is the nutmeg of commerce. Outside the shell, closely enwrapping it, is a bright crimson network, or arillus, which is the mace. In preparing the spices for export, fieldworkers first remove the pit with its mace from the husk. The aril is then carefully peeled away from the seedcoat. Fresh arils are brilliant red and leathery with a strong flavor of turpentine. The mace may be kept in one piece (called "double blade" in the trade) or separated into two halves ("single blade") before it is flattened by hand or between boards. It is then dried thoroughly in the sun or by artificial heat; during this process it gradually turns orange, then orange-yellow and acquires its characteristic aroma (3,4).

The nutmegs, still in their shells, are also dried, frequently over a smouldering fire. When completely dry, the seed rattles in the testa. Usually the shells are then cracked by machine or with wooden mallets and the seeds are removed for export. Sometimes, shelled nutmegs are treated with lime before shipping to protect them from insects. They are then sorted by size and packed. For the spice trade, nutmegs are valued according to size, smoothness, and freedom from adulteration with wild seeds (2,4).

The nutmeg tree requires a hot, humid climate. It is widely cultivated in the tropics, particularly on the Spice Islands (the Moluccas, an island group of eastern Indonesia), on Penang and other islands of Malaysia, and in the

Caribbean, notably on Grenada. The tree is slow-growing, taking 15 years to produce full yields. A good specimen produces 1,500–2,000 nuts annually—a weight of ten pounds of nutmeg to one-half pound of mace. The finest mace and the finest nutmegs come from Penang; because of their higher content of volatile oil, the East Indian spices are preferred to the West Indian (4).

Products of M. Frangans

Nutmeg Husks: The pericarp of the nutmeg fruit may be preserved in sugar, salted and dried as a condiment, or made into jellies. All of these preparations have the flavor of nutmeg and all are reported to be delicious. But they are unknown outside the regions in which the tree is grown (2, 3).

Nutmeg: Whole nutmegs are oval and woody with a ridged or wrinkled, light brown surface. Most are about an inch long, three-quarters of an inch in diameter. On cross section they show a heavy network of dark brown “veins.” Ground nutmeg, the familiar kitchen spice is a granular, orange-brown powder with characteristic aroma.

Depending on the variety, whole nutmeg contains from 5 to 15 per cent of a volatile oil that accounts entirely for the aroma and flavor of the spice. Ground nutmeg is subject to rather rapid losses of this component. In addition, dried nutmeg contains 25 to 40 per cent of fixed oil and 5 to 15 per cent ashes. The remainder is moisture, fiber, and starch (5). In the calendar year 1965, the United States imported nearly 5,300,000 pounds of nutmeg worth about \$3,800,000. Of this total, nearly 72 per cent came from Indonesia, while 24 per cent came from the Caribbean, with the remainder from a number of smaller ports. Imports over the past ten years have been fairly constant (Table I), but there has been a change in the major source of this spice. Until 1955, the U.S. obtained about half of its annual supply of both nutmeg and mace from the West Indies. In that year, however, a hurricane devastated the island of Grenada, and the nutmeg groves there have still not recovered from the damage (6).

Mace: Mace, another popular spice, is a brownish-yellow or brownish-orange granular powder with a strong aroma closely resembling that of nutmeg. The flavor of mace is somewhat less sweet and less delicate than the flavor of nutmeg. Whole mace contains from 4 to 14 percent of a volatile oil very similar to that found in nutmeg, along with moisture, fat, starch, etc.

TABLE I.—U.S. imports of nutmeg and mace*

	[pounds]					
	Average 1950–54	Average 1955–59	Average 1960–64	1963	1964	1965
Nutmeg	4, 852, 221	4, 141, 074	4, 151, 480	5, 124, 638	3, 505, 450	5, 271, 524
Mace	658, 193	549, 072	563, 874	558, 541	648, 900	619, 394

*Source: U.S. Department of Commerce, Bureau of the Census Compilation by American Spice Trade Association.

(5; 7, Vol V). In 1965, the United States imported 619,000 pounds of mace worth \$750,000. Seventy-six percent came from Indonesia, the rest from Malaysia, Hong Kong, Japan, and the Caribbean. As with nutmeg, imports of mace have not varied much over the past ten years (Table I).

Uses of Nutmeg and Mace: Both spices are classified as "baking spices" since they are much used in foods like doughnuts and other sweet doughs. Both have a warm, aromatic, slightly bitter taste. Nutmeg is commonly added to custards, puddings, pies, and eggnog. Mace is used in soups, sauces, and pastries, particularly pound cake. In addition, both spices are important ingredients of frankfurters and other meat products, pickles, tomato ketchup, and similar condiments. The American Spice Trade Association estimates that 55 percent of nutmeg and mace imported into this country is sold through retail stores to home consumers. The rest goes to institutions (hotels, restaurants, bakeries, sausage manufacturers, and other bulk users). Formerly, housewives bought whole nutmegs and grated them at home; today, most of the nutmeg and all of the mace sold for home consumption is ground.

Fixed Oil of Nutmeg: Known also as "nutmeg butter," this vegetable fat is obtained by exposing the nuts to hydraulic pressure and heat. At room temperature, it is an orange, tallowy mass with a pronounced aroma of nutmeg and the consistency of butter. Formerly used in medicine as an external application for rheumatism and sprains, it has some commercial importance today as an ingredient of certain soaps, hair tonics, and perfumes (2, 3, 5).

Essential Oils of Nutmeg and Mace: The essential or volatile oils of nutmeg and mace are obtained by steam distillation. Commercial oil of nutmeg is a mobile, pale yellow liquid with an odor and flavor of nutmeg. It is not satisfactory as a substitute for the spice in cooking because it does not exactly reproduce the flavor of whole nutmeg. ("Essences" of nutmeg and mace sold by spice dealers are alcohol extracts not essential oils.) But oil of nutmeg has been widely used in industry as a flavoring agent for perfumes and dentifrices. Chemically, it is a complex mixture of alcohols, esters, and organic acids, including about four percent myristicin, the main pharmacologically active component (7, Vol V; 8; 9).

History of Nutmeg

Nutmeg was unknown to the ancient Greeks and Romans, but probably, Arabian traders began importing it from the East Indies by the first centuries A.D. No definite evidence of *Myristica*'s appearance in Europe is recorded until the 12th Century, and the source of nutmeg was not discovered by the West until the Portuguese reached Banda in 1512. Portugal controlled trade in nutmeg and mace from that year until the beginning of the 17th Century, when most of the Pacific spice-producing territories fell into the hands of the Dutch. In order to keep prices of the spices very high, the Dutch tried to limit cultivation of the nutmeg tree to two islands, but their monopoly

was eventually challenged successfully by the French and British. Gradually, commercial development of *M. fragrans* spread throughout the world, reaching Grenada, for example, in 1843 (3).

Like most aromatics, nutmeg was as important in early medicine as it was in cooking (10). Its therapeutic applications were first catalogued by Arab physicians as early as the 7th Century A.D. Originally, it seems to have been a remedy for disorders of the digestive system, but before long it was considered beneficial in such diverse conditions as kidney disease, pain, and lymphatic ailments; it was even described as an aphrodisiac. Many of these beliefs are preserved in contemporary Arab folk medicine; in fact, Yemenite men still consume it to increase virility.

Similarly, nutmeg was and is a significant item in the Hindu pharmacopeia, where it has been prescribed for fever, consumption, asthma, and heart disease. Traditional Malayan medicine designates nutmeg for madness as well. According to an adviser in the Indian Ministry of Health, nutmeg is still used as an analgesic and sedative by folk practitioners, and is given in small quantities to induce hypnotic effect in irritable children.

Medieval European physicians, who generally followed the precepts of their Arab colleagues, also prescribed nutmeg for a long list of ailments. By the 1700's the spice attained its greatest reputation; thereafter, with the development of modern pharmacy, its importance as a medicine gradually subsided.

Curiously, nutmeg's popularity as a folk remedy had a brief, spectacular resurgence less than one hundred years ago. Near the end of the 1800's, a rumor spread among women in England and America that nutmeg could bring on overdue menstruation and even induce abortion. The origin of this mistaken belief is unclear, but its influence is well documented in dozens of case reports of nutmeg poisoning published in British and American medical journals of the period (10). The idea has even persisted into our times: Green in 1959 wrote of a 28-year-old Virginia woman who ate "18.3 Gm. of finely ground nutmeg in an attempt to induce the menses, which had been delayed two days (11)."

Reports of nutmeg poisoning date back to the late Middle Ages when several early physicians first wrote down their observations on the stupor-inducing powers of the spice. Doubtless, most of these intoxications resulted from overdoses taken as remedies. A late example comes from *A Treatise on the Materia Medica* written in 1789 by an English physician, William Cullen. He wrote:

I have myself had an accidental occasion of observing its [nutmeg's] soporific and stupefying power. A person by mistake took two drams or a little more of powdered nutmeg; he felt it warm in his stomach, without any uneasiness; but in about an hour after he had taken it, he was seized with a drowsiness, which gradually increased to a complete stupor and insensibility; and not long after, he was found fallen from his chair, lying on the floor of his chamber in the state mentioned. Being laid abed he fell asleep; but waking a little from time to time, he was quite delirious: and he thus continued alternately sleeping and delirious for several hours. By degrees, however, both these symptoms diminished, so that in about six hours from the time of taking the

nutmeg he was pretty well recovered from both. Although he still complained of headache and some drowsiness, he slept naturally and quietly through the following night, and next day was quite in his ordinary health.

There is no doubt that this was entirely the effect of the nutmeg. . . .

In 1829, the great physiologist J. E. Purkinje conducted self-experiments with nutmeg. Following a dose of three whole nutmegs, he experienced spatial and temporal disorientation similar to that of Cannabis intoxication. He wrote (12) :

At half-past six, when it was almost dark, I woke up in order to go to the Royal Theatre at Brueder Street where I lived. The distance was long, but this time I thought it had no end. My movements appeared entirely adequate, but were lost momentarily in dream pictures, from which I had to extricate myself with considerable force in order to keep on walking. My feet did their duty and, since I had to stick to a straight road, there was no danger of going astray. I went forward in this dream, for, if I attempted to orient myself, I could not even recognize the cross streets. Time seemed long, but I got to the opposite side of the place where I was going. During this time dreams and physical activity battled one another. The return journey was good, and I slept well that night and next day.

There is a similar, more dramatic report of mace intoxication from 1848 (13). But as stated earlier, the greatest numbers of people poisoned by *Myristica* have been English and American women of the late 19th and early 20th Centuries. Summarizing many of these cases in 1962, McCord wrote (14) :

. . . patients have consumed from 1 to 3 nutmegs and have experienced restlessness, dizziness, fear of death, coldness of extremities, occasional nausea and vomiting, abdominal pain, and precordial pain or oppression. These patients were found to be extremely agitated, delirious, and dyspneic and have had weak, rapid pulses and decreased body temperature. On several occasions patients were found unconscious. Occasionally there was flushing of the face while at other times pallor with cyanosis of the lips and nails predominated.

He attributed these intoxications to "a central nervous system depressive effect with periods of stimulation and associated respiratory and cardiovascular difficulties."

Only one fatality has ever been ascribed to nutmeg ingestion: near the beginning of this century, an eight year old boy ate two whole nutmegs, became comatose, and died less than 24 hours later (15).

Use of Nutmeg as an Intoxicant

The apparent epidemic of nutmeg intoxications around the turn of the century subsided after the First World War. Cases since then have been rare. In 1963, Payne presented one of the only published reports of deliberate ingestion of *Myristica* for narcotic effects. He described two college students, 19 and 20 years old, who each consumed two tablespoonfuls (about 14 g. or the equivalent of two whole seeds) of powdered nutmeg suspended in milk (16). About five hours later

. . . each had the onset of a significant pharmacologic effect, heralded by a leaden feeling in the extremities and a nonchalant, detached mental state described as 'unreal' or 'dreamlike.' Rapid heart rates and palpitation were noted, and both complained

of dry mouth and thirst. Onlookers observed that one student became quite hyperactive and agitated and talked incoherently. It was noted that the faces of both were as 'red as beets.' Nausea, vomiting, and abdominal cramps were absent. . . . One described a sense of impending doom, as if he were 'breaking up inside.'

Extreme drowsiness occurred about seven hours after these symptoms began and continued for the next 24 hours. Recovery was complete, but "both patients stated emphatically that a sense of unreality persisted for 48 to 60 hours from the time of one oral dose of nutmeg."

A history of the use of nutmeg for the express purpose of inducing these bizarre physical and mental effects is hard to piece together simply because reliable data on *Myristica* narcosis are not available. The medical literature is of no help, for example, because nearly all the reported cases have resulted from accidental ingestions or overdoses taken as remedies. Most of the information on nutmeg as a psychoactive drug is anecdotal, and it has been most difficult to document the anecdotes.

Stories in circulation about nutmeg at the present time develop several recurrent themes. One is that *Myristica* is used as an intoxicant in certain parts of Asia. Another is that nutmeg is widely consumed by prison inmates in this country. A third is that students and 'beatniks' have adopted the the spice as a new hallucinogen.

For the first story little supporting evidence can be found. A suggestive clue is one of the synonyms for nutmeg used in Ayurveda, an ancient Hindu scripture. Here, nutmeg is called *Mada shaunda* meaning "narcotic fruit." There is reason to believe that nutmeg is, in fact, eaten as an intoxicant even today by some people in India who add it to betel chew. It may also be mixed with tobacco and snuffed in this part of the world. Equally vague is a report that nutmeg is taken as a stimulating snuff by natives in remote regions of Indonesia. Still another unsubstantiated assertion is that nutmeg is often substituted for hashish in Egypt when the hemp product is not available.

It is much easier to confirm rumors of nutmeg use by prison inmates, despite denials by prison officials. One interesting reference occurs in *The Autobiography of Malcolm X (17)*, in which the late Black Muslim leader describes his incarceration in a Boston prison in 1946. He was then a user of marihuana and other drugs and found himself suddenly cut off from them. He wrote:

I first got high in Charlestown [prison] on nutmeg. My cellmate was among at least a hundred nutmeg men who, for money or cigarettes, bought from kitchen-worker inmates penny matchboxes full of stolen nutmeg. I grabbed a box as though it were a pound of heavy drugs. Stirred into a glass of cold water, a penny matchbox full of nutmeg had the kick of three or four reefers.

A more recent but less accessible reference was a short article on page 22 of the Chicago *Sun-Times* for March 3, 1961. It told of the dismissal of a Cook County Jail guard caught smuggling nutmeg and nose inhalers into the jail.

An officer of the Federal Bureau of Prisons has written (18):

We are aware of the narcotic reaction these spices may have when improperly used, and, therefore, it is standard practice in the Federal prisons to maintain careful control of both items [i.e., nutmeg and mace]. Due to this control and also to the

fact . . . that few people are aware of their stupor-inducing powers, we have no problems with these items. I have read articles in various publications which imply that the use of nutmeg and mace is widespread in prisons. However I do not know of a single instance in the Federal Prison system where either spice was used by inmates for its narcotic effect.

There is, however, ample confirmation of this rumored use of nutmeg in a study conducted by Weiss at the New Jersey State Prison at Trenton in 1960. Weiss wrote (19) :

It is widely believed by inmates of correctional institutions that the drug action of nutmeg produces reactions similar to those of legally prohibited drugs which are considered habit-forming and addicting. Although its illicit application is most certainly not widely known in the extra-mural setting, personal communications by prisoners are to the effect that it is used, not only in the community [i.e., the outside], but was also used in the armed forces in Europe in World War II.

Weiss studied ten male inmates of the prison, most of whom had had previous experiences with marihuana and other drugs. Six of them had learned of the use of nutmeg during their imprisonment; the others had already known about it. The number of times these men had tried *Myristica* was impressive. One had taken nutmeg on 10 different occasions, one 30, one 52, and one 475. The minimum amount of ground nutmeg any man ingested was 2 to 3 tablespoonfuls, and one had once taken two cups of the spice as a single dose (apparently without untoward effects). The drug was always taken orally, usually stirred into hot liquids.

Weiss noted no uniformity of time of onset of action, which ranged from 10 minutes to four hours. Duration of action ranged from four to 24 hours. Most of the subjects compared nutmeg to marihuana, although some also likened it to heroin and alcohol. Most experienced a sense of being transported aloft, along with drowsiness in some cases and excitement in others. In all instances thirst was increased, but hunger was not stimulated. Reported side effects included nausea, abdominal spasm, vomiting, constipation, tachycardia, insomnia, and drowsiness.

Two cases of acute brain syndrome, with psychotic reaction due to nutmeg intoxication, were reported. Each of the two subjects had chronically ingested powdered nutmeg over a long period. . . . Aside from these cases of poisoning, the hallucinogenic effects reported were transitory and of brief duration.

Consumption of nutmeg was an important aspect of life in the prison. Weiss has added (20) :

Inmates would carry little matchboxes in which they would store a supply of nutmeg (equivalent to one dose). They could then take the dose along with them to the shops in which they worked during the day. Users consider themselves to be more lively and cheerful. Thus, they feel they have dispelled their inner gloom. However, drug users seldom take nutmeg once they leave the prison since they consider its effects to be inferior to those of heroin or marihuana, whatever may be the similarity between them.

Shortly after Weiss's article appeared, nutmeg was banned from the New Jersey State Prison kitchen.

I have received information from several former prison inmates, suggesting the practice to be common. One correspondent writes: "During 16 months in a Massachusetts correctional institution, I knew three individ-

uals who on occasion did use nutmeg as a snuff for 'kicks.' It was done on weekends and widely dispersed as to time." Another, from California, writes: "I can tell you that nutmeg is a commonly used high within prison walls—so much so that it is frequently locked up apart from the other normally used spices. . . . Convicts, because of the nature of their environment, have rarely any alternative high."

A final reference is this line from William Burroughs's *Naked Lunch* (21): "Convicts and sailors sometimes have recourse to nutmeg. About a tablespoon is swallowed with water. Result vaguely similar to marihuana with side effects of headache and nausea."

Like prisoners, jazz musicians are said to have long used nutmeg as a substitute for other drugs, especially marihuana. Confirmation is hard to come by. The only clear reference I have been able to find is a 1962 biography of the late Charlie Parker, known as "Bird." The leader of the band in which Parker made his recording debut in 1942 is quoted as reminiscing (22):

Bird introduced this nutmeg to the guys. It was a cheap and legal high. You can take it in milk or Coca Cola. The grocer across the street came over to the club owner and said, "I know you do all this baking because I sell from 8 to 10 nutmegs a day." And the owner came back and looked at the bandstand and there was a whole pile of nutmeg boxes.

To summarize thus far: The toxic properties of nutmeg have been recognized for hundreds of years, probably ever since the spice was first prescribed medicinally in large doses. Published reports of *Myristica* narcosis were most frequent around the turn of the last century when many women took nutmeg as an emmenagogue or abortifacient. Some evidence suggests that nutmeg may have long been used as an intoxicant in certain parts of Asia. In our century, for at least the past thirty years, prisoners, jazz musicians, sailors, and probably others have used nutmeg as a substitute for marihuana or other drugs. They either eat or snuff it in variable amounts and commonly experience symptoms much more like those of the familiar hallucinogens than those described in the old reports of nutmeg poisoning.

Use by Students

In our own society the fastest-growing group of drug-takers is not the prison population or jazz world but rather students and "student-types." I do not care to add another guess to the many published estimates of what percentage of college youth experiments with hallucinogens. I will simply point out that most observers find that significant numbers of students now try marihuana and stronger drugs like LSD. It is especially noteworthy that many of these people would never have indulged in such activities even five years ago. I doubt, for example, that more than a handful of law students, medical students, or divinity students had experienced the effects of *Cannabis* before 1963, when hallucinogens first came to the full attention of the national press. But today many occasional marihuana

smokers come from these groups. Students have also been the initiators of drug fads in recent years. The flurry of excitement over morning-glory seeds in 1963 and 1964 was generated largely by college undergraduates and high school pupils. One would expect that nutmeg, because of its frequent use by other groups as an alternative hallucinogen, might also be included in the student's or beatnik's index of psychoactive substances.

I have been particularly interested in this possibility because I first learned of *Myristica's* psychopharmacological potential through an invitation to a "mace party" given by several undergraduates at Haverford College near Philadelphia in 1961. The students said they and many of their classmates had been introduced to the spice by a visiting beatnik from Baltimore, who had sponsored several mace parties on campus.

Only one case of this sort has appeared in the medical literature—Payne's report of 1963, mentioned earlier. His two students had gotten the idea of taking nutmeg from a "beatnik acquaintance," who told them it would provide "a mental state somewhat akin to ethanol intoxication without requiring the use of alcohol" (16). I have been able to find only one other published account—an article titled "Nutmeg Jag" in the summer, 1964 issue of a University of Mississippi student magazine. It described a nutmeg party attended by eight persons. One participant—a young man who consumed a whole standard-size can of the ground spice (nearly 40 g. or 1.5 oz.)—recalled afterward (23):

I felt as if I were in an echo chamber . . . my voice sounded vague and distant . . . it was like being drunk without the ordinary alcoholic effects. . . . Two friends of mine had told me about the 30-cents, three-day drunk they had after taking nutmeg, so I tried it out of sheer disbelief.

Over the past six months I have been in touch with officials of student health services at representative universities throughout the country in an attempt to collect additional reports of *Myristica* intoxications. Significantly, most of the responding physicians were unaware of nutmeg's non-culinary uses. Only two university clinics had cases on record. Dr. Henry B. Bruyn of the University of California at Berkeley student health service notes two instances of intoxication. In October, 1963, two days after an issue of the *Ladies Home Journal* appeared with a reference to nutmeg in a story on hallucinogenic drugs, a 20-year-old female student was admitted to the hospital with a chief complaint of abdominal cramps. The night before she had taken 4 teaspoons of ground nutmeg because a friend had told her it would get her high. Her roommate joined her in this ingestion. The next morning she awoke drowsy and fainted in the bathroom. Physical examination was normal except for orthostatic hypotension, and she was recovered the day after admission. She told a physician she had taken the spice because she "felt she needed something to do."

In January, 1965, a second female Berkeley student was admitted, age 17, again with abdominal cramps. Four hours previously she had eaten 2½ teaspoons of nutmeg because she had heard it would give her hallucinations. She, too, recovered quickly.

Dr. B. W. Murphy of the University of Maryland contributes one other case. He writes that he knows of a male student who induces dreamy hallucinatory states by ingesting a whole can of ground nutmeg.

Does the scarcity of reported cases indicate a low frequency of nutmeg use by students? Probably not—just because students are reluctant to present themselves for medical treatment of drug intoxications, even when they suffer alarming symptoms. Relying solely on health services records, one would conclude that marihuana is also very little used by college students.

To get a more accurate idea of the extent of experimentation with nutmeg on college campuses, I placed advertisements requesting information on the spice in several student newspapers and also interviewed students from many areas of the country. By these methods, I easily collected a number of accounts of nutmeg narcosis. I have selected some of these to illustrate typical patterns of use.

Case #1 (college sophomore)—

I heard about the effects of mace from a beatnik who visited our campus and induced students to "turn on" with two teaspoons of this spice stirred into fruit juice. I didn't try it at the time, but a few months later five of us held a mace party in my apartment. To the disappointment of all, we felt just the same three hours after drinking down the mace. Convinced that the alleged hallucinogenic properties of mace were imaginary, we separated and I went to bed. I remember feeling somewhat lightheaded and having vague stomach pains before falling asleep, but I had no other symptoms until I woke up the next morning with a splitting headache, a burning thirst, and malaise. I later learned the other four had felt much the same on arising.

Case #2 (college juniors)—

Five of us tried to get high by eating two whole nutmegs each. They are terrible things to try to chew up and swallow. We all had warm feelings in our stomachs immediately afterward and began sweating more than usual. One of us eventually had a pronounced reaction, but the rest of us noticed nothing unusual and gave up after two hours. The next morning we all had headaches, extreme dryness of mouth and throat, creaking joints and dizziness.

One of us had a different experience. He went back to his room to read, and exactly four hours after taking the nutmeg he was suddenly overcome by a drowsiness so profound that he could hardly get up to turn off the light. As he fell into bed he had impressions of 'strange shapes floating' around him. He then sank into a heavy sleep. When he woke up seven hours later, he could barely move. He was very dizzy and staggered when he tried to walk; also, he could not see clearly for several minutes. His mouth and throat were parched, and water did not relieve the dryness. Two hours after he got up he again became drowsy and "sank into a sort of trance state." At this time he had a vivid impression that he was floating with his limbs separated from his body. Eight hours later he was fully recovered.

Case #3 (an ex-student in San Francisco)—

I have had completely negative results from nutmeg, perhaps partly precipitated by the environment and definitely partly by the nauseating effects of the drug. I ate three ounces, which may well have been too much. About two hours later I drank four beers. Then about three-quarters of an hour after the beer I began noticing unusual effects. I was in an unfamiliar night club and started to become disoriented. I talked continuously and repetitively, but it seemed as though another person were talking. I seem to have been wandering around in a daze, unaware of my surroundings. I was then ejected

from the club. Paranoid delusions set in. I believed the owners of the club had drugged me. I forced my way back in, which resulted in my being jailed for drunk and disorderly conduct. The day I spent in jail was one of total confusion. In fact, it was a full day before I realized I was in jail. I was very belligerent, a condition apparently precipitated by the belief that I was going to be executed. I became ill and vomited. I imagined the other prisoners were Nazis who were guarding me. One day in jail finally restored my reason, and I was released. No hallucinations occurred as far as I can recall.

Case #4 (college junior)—

I drank one ounce of nutmeg in water. Four hours later I began feeling feverish and delirious. These sensations continued for several hours and left me with a bad hangover. I would not repeat the experience.

Case #5 (21-year-old female secretary for a student newspaper)—

I took one teaspoon of nutmeg in water after reading about it in Malcolm X's autobiography. Nothing happened.

Case #6 (college junior)—

I took a whole can of nutmeg mixed with water. I had no effects at all from it.

Case #7 (medical student)—

When I was a junior in college at the University of Colorado, I got to know a group of nutmeg-takers because the leader of it had been a close high-school friend. In 1963, I went to his apartment for drinks, and he told me to take a matchboxful of ground nutmeg, packed into gelatin capsules. The method of these people was to take the nutmeg before they went to bed so that they would wake up high and avoid the nausea nutmeg often caused. Most said the effects were different from both morning-glory seeds and marihuana. Some experienced floating feelings. They took nutmeg occasionally for kicks, but did not attach too much importance to it. I do not know where they first learned of this habit, but my friend had worked as a volunteer in a prison before 1963 and may have been told about it there.

Case #8 (college sophomore)—

One evening my roommate and I each took a tablespoon of nutmeg in water after reading about it in Malcolm X's book. Nothing happened, so I went to bed. I woke up the next morning with incredible malaise and tachycardia. These symptoms eventually subsided but have recurred about once a week accompanied by severe anxiety for the past year. This reaction occurs spontaneously but also is brought on by eating anything containing more than a minute amount of nutmeg. One doctor has suggested that it may be an allergic reaction. My roommate had no effects except that he still cannot eat anything with nutmeg without experiencing an overpowering taste of the spice.

Case #9 (college junior)—

A friend told me about nutmeg and came over to show me how to do it. He mixed a drink of about half coffee and half nutmeg, which my roommate and I drank. Nothing happened to us in an hour, so we went to bed. Next morning I found myself on the floor with the worst hangover of my life. My roommate felt as bad. To this day neither of us can eat anything with nutmeg—we can't bear the taste.

Case #10 (a 42-year-old Berkeley woman who describes herself as "eccentric" with a "terrible fear of marihuana" and other drugs. After reading of nutmeg in a "manual of hallucinogenic drugs" she decided to try it since it was "cheap, legal, and available." She took nutmeg on several occasions and wrote extensively about her experiences. Here is one description.)—

I drank about five grams of nutmeg in a glass of fruit juice at about 9:30 a.m. An hour later I felt a surge of happiness when a freight train whistled. I closed my eyes

in search of hallucinations, but none came. A certain diuretic effect and pungent scent in my urine were evidence that the drug had already taken effect. I read the morning paper until 11:30 when there came a pleasant drowsiness. I closed my eyes and saw: silver spears of grass waving across an azure sky, silver waves of poplar trees swaying and dancing in the sun. I arose to walk and staggered. The light was flickering and dim as if I were partially blind, so I lay down on a couch in the kitchen. Closing my eyes again, I was overwhelmed by visions: golden spangles and rings of light on moving water, dancing moons and stars, everywhere a predominance of gold and silver images....

About 12:30 I opened my eyes and noticed that the stove was far, far away; the very walls had receded; the kitchen was cathedral-like in its dimensions. I stood up to look at myself, and I was unusually tall. My feet were small and far away; it was like looking through the wrong end of binoculars. I thought to myself, "This must be what marihuana is like."

The effect continued several hours until she fell asleep. There were no aftereffects.

Conclusions

From these and other cases I draw the following conclusions:

1. Significant numbers of students and persons living in student communities attempt to induce hallucinations with *Myristica*.
2. Unlike prisoners or musicians, who resort to nutmeg when their supplies of standard drugs are cut off, students often take nutmeg as a first experience before they try Cannabis or other substances. Nutmeg and mace are cheap, legal, and available at the nearest grocery store.
3. Typically, the young nutmeg-eater first learns of the spice's psychoactivity from a friend or from a published reference.
4. Doses range from one teaspoon to a whole can of ground nutmeg. Almost always, the spice is drunk in a glass of juice or water.
5. Onset of action is commonly 2 to 5 or more hours after ingestion. Most neophytes are not aware of the delay. In a very common pattern of intoxication, a person takes an adequate dose of nutmeg in the evening, goes to bed after several hours of waiting in vain for effects, and wakes up the next morning with many of the physical symptoms of toxicity: malaise, headache, dry mouth, tachycardia, dizziness.
6. Some of the reported reactions to nutmeg must be purely psychological. A dose of one teaspoon is probably insufficient to cause true symptoms. Similarly, hallucinations or mental changes that come on within thirty minutes of ingestion are likely to be factitious.
7. Reactions to nutmeg vary from no mental changes at all to full-blown hallucinogenic experiences like those caused by hashish or LSD. There is no apparent correlation between dose and psychoactive effect. Might this extreme variability represent differences in pharmacological potency of different batches of nutmeg? Or do people vary greatly in their sensitivity to the active principle?
8. Visual hallucinations are rather less frequent with nutmeg than with drugs like LSD or mescaline, but distortions of time and space perception

with feelings of unreality are common, as with Cannabis. Sensations of floating, being transported aloft, or having one's limbs separated from the body are frequently reported.

9. Effects of a single dose of nutmeg usually subside within 12 to 48 hours. An intriguing aftereffect occasionally mentioned is persistent sensitization to the taste of the spice.

10. Most young people who try nutmeg take it once or twice but do not use it habitually. Those who regularly smoke marihuana regard nutmeg as an inferior hallucinogen, largely because of the unpleasant side effects.

11. Ignorance of the psychoactive properties of nutmeg is unquestionably the most important factor limiting extent of its use as a drug.

I want to emphasize the last point. I began this general review by indicating the differences between nutmeg and other hallucinogens. From a public health viewpoint, the crucial difference is that most persons in the country have not yet heard that nutmeg is intoxicating. Not only is nutmeg cheap, legal, and available, it is also familiar, which makes it seem safe and inviting to those looking for a first hallucinogenic experience. These considerations lead to one inference: as publicity is accorded the psychopharmacological properties of *Myristica*, use of nutmeg and mace as intoxicants will certainly increase. Hopefully, we will soon have the knowledge to determine the dangers and potential values of this modern use of an ancient spice.

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