

# Dr. O'Shaughnessy in India

It was William Brooke O'Shaughnessy, MD, sent to Bengal by the British East India Company in the 1830s, who informed European physicians about the medical potential of Cannabis (which he referred to as "Indian Hemp").

O'Shaughnessy could not have made his contribution to Western Medicine if he'd been a racist or a snob. He regarded his Indian colleagues and students with the utmost respect, as confirmed by this excerpt from *History of Medical Science: Influence of Western Education in 19th Century Bengal* by Binaybhusan Ray, published 2005, Sahityalok. Translated from Bengali to English by Tapoja Chaudhuri, PhD, with assistance by Sunil Aggarwal, MD, PhD.

In India O'Shaughnessy advised the medical establishment to train teachers, to teach in the mother tongue, and to study and make use of indigenous (and affordable) herbal medicines.

In 1809 in the town of Limerick in Ireland, Valiyal O'Shaughnessy's son William O'Shaughnessy was born. During his childhood his nickname was Boswell. He was sent to Edinburgh for his medical education. From there he received his M.D. degree in 1830.

O'Shaughnessy joined the East India Company as an assistant surgeon. He came to Bengal in 1832.

During this time, the government commissioned a committee to teach Western medical science to students who had been training in native medical institutes. O'Shaughnessy had come through France en route to Bengal and he was inspired by the education provided by the Normal schools. In those institutions, teachers were given training in all general subjects. O'Shaughnessy recommended this approach [med school classes to be taught in the mother tongue while students learned English] to compensate for the lack of medical education in British India.

He presented a formal letter to Lord William Bentinck through Major Teller expressing his opinions. Without mentioning his own personal opinions, Lord Bentinck sent O'Shaughnessy's document to this newly commissioned committee. The main statements of this document were:

- The establishment of an English medical science college in Calcutta with five professors and fifty scholarships. The same kind of practical training should be given there as that given in the schools in Great Britain. Its main purpose would be to educate madhyamik [Class 10] level teachers.
- In the next stage, the establishment of a madhyamik-level class for three years. Their education will be conducted in their mother tongue. Students educated in the English medical college will teach there. The curriculum would be based on France's educational institutions.

The Committee did not heed O'Shaughnessy's recommendations (except the establishment of an English medical college). One institute was established in a misdirected fashion and the half-educated students from there practiced only in Calcutta. However, at that time, there were more than enough European doctors practicing in Calcutta.

In 1836 O'Shaughnessy established a program with the English class students. Each day a student would give a lecture. The goal was to produce teachers for the future. But this plan had to be stopped due to the limited knowledge of these students.

In November 1839 the government was compelled to open a medical science class in Urdu. Shivchandra Karmakar was the chemistry and botany professor. Nabakrishna Gupta was the professor of anatomy and similar topics...

The college council established an exam

in 1841 and after six days of exam, 11 students were considered to be capable.

O'Shaughnessy was acknowledged by a letter in *Friend of India* magazine. It said: "The whole country is grateful to Dr. O'Shaughnessy for his successful plan of a medical science school. The main purpose of this institution is to remove quack doctors by creating a group of doctors educated in medical science and surgery through the medium of the mother tongue and they will be good for the nation.

"The government is completely aware of the necessity of schools in mother tongue and will definitely keep an eye towards its progress... The anti-mother tongue tendency of the education council is gradually diminishing and it would not be surprising if within the next two or three years a plan for educating through mother tongue is adopted. In any case, in the current context, even if the education council is not expanding this, it won't hold an aversion towards the essential medical science school in mother tongue."

## Using Indigenous Medicines

O'Shaughnessy took a medical position under Lord Metcalfe in 1833. Later, after a Medical College was established in Bengal, he joined it in the position of a teacher.

In 1838 the government formed a committee to assess the status of the [East India] Company's dispensary and to explore the possibilities of using indigenous medicines. Involved were Dr. W. Jackson, Dr. J. Rankin, Mr. Bramley, Dr. Pearson, Mr. James Princep, and O'Shaughnessy. Before their work was over, however, the committee stopped functioning due to the death of some members, personal ill health of many others, and some other unpredictable circumstances.

At that point O'Shaughnessy was given the sole responsibility for the project. He based his report on the following factors:

- The use of pharmacopeia and thoughts about Nature.
  - Discussion of pharmacopeia published in Europe and America.
  - Discussion about the necessity of publishing a pharmacopeia in Bengal and its potential benefits.
  - Description of procedures for investigation [for working on a new pharmacopeia] and its dissemination.
- O'Shaughnessy presented five reasons for publishing a separate pharmacopeia for Bengal:
- Most of the plants and shrubs described in the British pharmacopeia are not found in India. Hence, it is necessary to investigate indigenous plants and shrubs in their stead.
  - Many indigenous plants and shrubs found in India can cure numerous diseases. There is no mention of these plants in the British pharmacopeia.
  - Based on factors like cost of labor and special restrictions on taxable imported goods, the rules about medicines have been revised in the British pharmacopeia. However, since these restrictions are not applicable to India, there is no benefit from such discussions.
  - In many cases there is a necessity for a complete discussion of chemical production processes.
  - There is a dire necessity to change the language of the British pharmacopeia to better suit the standard of education of the people in this country and its environment.

O'Shaughnessy emphasized the necessity of certain steps in producing the pharmacopeia:

- Define scientific terminology.
- Provide brief and clear instructions for distillation, sublimation etc. in terms of producing medicines.
- Alphabetically arrange medicines produced from plants and provide the follow-

ing scientific criteria for each: history, botanical illustration, places to acquire them, market price, method of use, and proportions for preparation.

- Alphabetically arrange pictures of chemically produced alkaline, mud, and metallic materials in stone-carved vessels and discuss their prices, natures, and uses in medicine.

- Mention the formulas of making medicinal pills, alcoholic preparations, and their extractions and procedures to make them in bulk as well as their prices

- Discuss medicinal liquid material contents with regards to weight and volume and using both English and Indian measurement units.

*A day will come when these people can open shops in many places and can compete with government medicinal shops.*

- Include clear enough instructions for indigenous medicine producers in the pharmacopoeia. For those youths who can speak in English, Hindi, and Bengali, it is essential to pay attention to providing them education so that they can gain these skills with little effort and expense. As a result of this, a day will come when these people can open shops in many places and can compete with government medicinal shops.

## A Second Volume

Just a few days after the first issue was published, O'Shaughnessy brought out another volume to compensate for the fact that in Bengal some necessary medicines must be imported from Europe. This volume discussed medicines that indigenous doctors have been familiar with for a long time. But till this day, in all the pharmacopoeias that have been published, there haven't been any mention of these medicines.

The second volume discussed how to substitute indigenous medicines when imports from Europe were unavailable.

O'Shaughnessy published a book about chemistry in 1837. Discussing its purpose, in the preface he said it had been published for medical students and medical assistants. Compared to the expensive European textbooks, this book would be accessible.

As a teacher working in the medical college, he was familiar with the students' range of understanding. Those enlightened by Western education were very familiar with the main topics in the physical sciences. His book was aimed at those with no previous understanding of the elements.

There is a dearth of modern instruments and laboratories in Bengal. Those who must depend on materials available in the market to conduct experiments are not helped by texts that refer to expensive European instruments. O'Shaughnessy wrote his chemistry book for those conducting-experiments with cheaply produced instruments.

At the end he discussed several matters based on his personal experiences as a chemist. Included was an account of how to investigate murder by poison (a noted incident in this country), and how to treat kidney stones.



LINE DRAWING OF O'SHAUGHNESSY AND DR. GOPAL CHANDRA ROY from the *History of Medical Science: Influence of Western Education in 19th Century Bengal*. Roy, who attended Calcutta Medical College, published a paper 'On the solvent action of Papaya juice on the nitrogenous articles of food' in the *Glasgow Medical Journal* (1874) — thought to be the first article by a native Indian in a foreign journal.

*Investigating and using native plants would not only benefit the poor, O'Shaughnessy wrote, but would create a corps of applied chemists.*

Chemists make quinine from a type of bark from Peru. In this country, to treat fever, rulers import that bark, quinine, and other medicines from Europe and America. It was difficult for the indigenous poor to buy those expensive medicines. However, in Indian jungles, there are many similar botanicals. One of them is miasmata.

Investigating and using native plants would not only benefit the poor, O'Shaughnessy wrote, but would create a corps of applied chemists. Instead of relying on other countries to provide necessary medicines, India would be independent.

O'Shaughnessy also discussed opium and its adulterants. He had previously written an article in *The Lancet* magazine about adulterants found in sugar.

O'Shaughnessy published an article about India's herbals in *Medical and Physical Society Transactions* (Calcutta, 1842), noting that from 1835-1838, the government spent 6,511 pounds importing 12 medicines for druggists in Calcutta, Bombay, and Madras. Another 188 medicines, cost only 3,000 pounds.

In India there are many herbals that indigenous doctors always —and European doctors on special occasions— use. As an example, he mentioned surgeon doctor

*continued on next page*

## PROVINCIAL MEDICAL JOURNAL

And Retrospect of the Medical Sciences.

No. 123. LONDON, SATURDAY, FEBRUARY 4, 1843. [Stamp: W.B. O'SHAUGHNESSY]

ON THE PREPARATIONS OF THE INDIAN HEMP, OR GUNJAH, (Cannabis indica) AND THEIR EFFECTS ON THE ANIMAL SYSTEM IN HEALTH, AND THEIR UTILITY IN THE TREATMENT OF TETANUS AND OTHER CONVULSIVE DISEASES.

By W. B. O'SHAUGHNESSY, M.D., Bengal Army, Late Professor of Chemistry and Materia Medica in the Medical College of Calcutta. (Continued from p. 96.)

Experiments by the Author—Reference as to the Action of the Drug on Animals and Men.

Such was the amount of preliminary information before me, by which I was guided in my subsequent attempts to gain more accurate knowledge of the action, power, and possible medicinal applications of this extraordinary agent.

There was sufficient to show that hemp possesses, in small doses, an extraordinary power of stimulating the digestive organs, exciting the cerebral system, of acting also on the generative apparatus. Larger doses, again, were shown by the historical statements to induce insensibility or to act as a powerful sedative.

The influence of the drug in allaying pain was equally manifest in all the meninges referred to. As to the evil sequelae so unanimously dwelt on by all writers, these did not appear to me so numerous, so insidious, or so formidable, as many which may be clearly traced to over-indulgence in other powerful stimulants or narcotics—viz, alcohol, opium, or tobacco.

The dose in which the hemp preparation might be administered, consisted, of course, one of the first objects of inquiry. The Baiter had mentioned a dose, or forty-eight grains of powder, but this dose seemed to me so enormous, that I deemed it expedient to proceed with much smaller quantities. How fortunate was this caution, the sequel will sufficiently denote.

An extensive series of experiments on animals was in the first place undertaken, among which the following may be cited:—

Expt. 1.—Ten grains of Nigella extracta, dissolved in spirit were given to a middling sized dog. In half an hour he became stupefied and sleepy, dozing at intervals, starting up, wagging his tail as if extremely contented, he ate some food greedily, on being called he was staggered to and fro, and his face assumed a look of utter and hopeless drunkenness. These symptoms lasted about two hours, and then gradually passed away; in six hours he was perfectly well and lively.

Expt. 2.—One drachm of opium was given to a small sized dog; he ate it with great delight, and in twenty minutes was rickily drunk; in four hours his symptoms passed away, also without harm.

Expt. 3. A dog—These little had ten grains each of the alcoholic extract of gunjah. In one no effect was produced; in the second he became much insensible, and some inability to move; in the third a marked alteration of countenance was conspicuous, but no further effect.

Expt. 6.—Twenty grains were given, dissolved in a little spirit, to a dog of very small size. In a quarter of an hour he was intoxicated; in half an hour he had great difficulty of movement; in an hour he had lost all power over the inferior extremities, which were rather stiff but flexible; sensibility did not seem to be impaired, and the circulation was natural. He was there the least inclination of pain, or any degree of convulsive movement observed.

In some of these or several other experiments it seems needless to dwell on the details of each experiment; suffice it to say that they led to one remarkable result—that while carnivorous animals and fish, dogs, cats, swine, vultures, crows, and vipers, invariably exhibited the intoxicating influence of the drug, the granivorous, such as the horse, deer, monkey, goat, sheep, and cow, experienced but trivial effects from any dose we administered. Encouraged by these results, no hesitation could be felt as to the perfect safety of giving the resin of hemp an extensive trial in the cases in which its apparent power promised the greatest degree of utility.

Cases of Rheumatism treated by Hemp. Catalogue prepared by one grain.

THE PROVINCIAL MEDICAL JOURNAL was published in London and widely read by British and other European physicians. W.B. O'Shaughnessy's paper "On the preparations of the Indian Hemp, Or Gunjah (*Cannabis indica*)" was dated February 4, 1843.

a mild but common side-effect

# Xerostomia (better known as Cotton Mouth)

When exogenous cannabinoids are consumed, increased activation of CB1 and CB2 receptors in the salivary glands causes saliva levels to drop.

By Joshua Ahn

A dry feeling in the mouth, often described as “cotton mouth,” is a fairly common side effect of consuming cannabis. In medical literature this condition is known as *xerostomia*.

As reported in 2006 by Juan Pablo Prestifilippo and colleagues at the Centro de Estudios Farmacologicos y Botanicos in Buenos Aires, cotton mouth from cannabis is caused by increased activity at cannabinoid receptors (both CB1 and CB2) located in saliva glands. This results in reduced saliva output—hyposalivation).

A 2011 study by Olga Kopach and Juliana Vats at The State Key Laboratory of Molecular Biology in Kiev confirmed that under normal conditions, cells in saliva glands use endocannabinoid signaling as part of a feedback mechanism to prevent excess amounts of saliva from accumulating in the mouth.

When exogenous cannabinoids are consumed, increased activation of CB1 and CB2 receptors causes saliva levels to drop significantly, producing feelings of dryness in the mouth.

Kopach also found that the two receptors produce slightly different effects on a cellular level.

CB1 receptors predominantly modulate the flow of saliva, while CB2 receptors seem to influence consistency and content of saliva (such as sodium levels).

Drugs that antagonize the cannabinoid receptors induce an increase in saliva output. Kopach used AM251 (which targets CB1) and AM630 (targets CB2) to show that the decreased saliva output caused by THC consumption is reduced or even blocked when antagonist drugs are administered.

Cells in the salivary glands can synthesize anandamide. Exploration of the endocannabinoid system in the mouth may lead to new therapies for people with serious salivary problems.

It may even be possible to develop a cannabinoid antagonist chew that would reduce cotton mouth or help people with other forms of dry mouth. This chew could be spit out before being swallowed so the

effects stay localized in the mouth.

Although the mouths of cannabis consumers may feel dry on occasion, THC and the other plant cannabinoids do not cause dehydration throughout the body. This is why cannabis does not cause severe hangovers the way alcohol does. The body is not becoming dehydrated—saliva remains inside the glands instead of being secreted. The moisture is there, it's just not being released into the mouth and throat.

Cotton mouth may be bothersome, but it is readily resolved by drinking water—a healthful thing in and of itself.

### A Possible Concern

“Our saliva washes away sugars and other substances that help promote cavities. It neutralizes the acids in our mouths,” explains Gene Watson, D.D.S., Ph.D.

A comprehensive Index-Medicus review by J Guggenheimer from the University of Pittsburgh shows that dry mouth in different types of cases (not just cannabis-induced) may be connected with greater risk of dental cavities. Saliva contains compounds that protect teeth from decay. When salivation decreases parts of teeth which are normally protected from cavities become more vulnerable to damage.

Although no pattern of tooth decay has been associated with cannabis consumption, some anecdotal evidence is concerning. A consumer we'll call Valerie recently needed extensive dental work due to multiple cavities. She was told by her dentist that the pattern of decay suggested that the cause was oral dehydration. The dentist asked if she was consuming anything that would make her mouth dry? The only thing she could think of was her frequent episodes of cotton mouth which she didn't tell the dentist about. She now makes a better effort to stay hydrated.

One study by Swiss researchers compared 43 cannabis consumers and 42 cigarette smokers and found no increase of decayed or filled surfaces, plaque or gingivitis amongst the cannabists. But the cannabis consumers were found to have more

cavities on smooth tooth surfaces when compared to a group of abstinent Swiss Military recruits.

### Water is the antidote.

Other negative side effects from cotton mouth are mostly trivial. Stale breath may be a concern, as is the need to make sure the mouth is hydrated before biting into dry foods. Eating crackers with severe cotton mouth can become quite a challenge without a good sip of water first. Exercise with cotton mouth can also lead to a very parched sensation in the throat. Water is the antidote.

### A Beneficial Effect?

Because cannabis increases the desire to drink fluids while not actually causing problematic dehydration, it may improve water intake allowing for a large variety of health benefits. My consumption of cannabis has made me much more mindful of the amounts of water I consume.

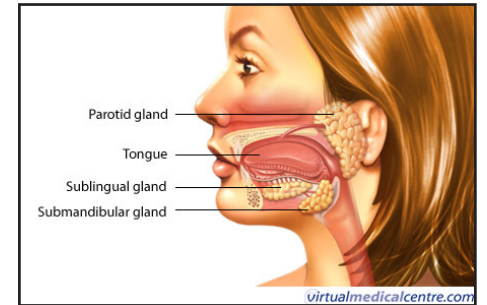
Nutrition experts such as the European Food Safety Authority recommend that the average adult should drink eight to 10 glasses of water per day. Those who exercise or perform physical labor may need as many as 12 glasses per day for optimal well-being.

*43% of adults in the U.S., according to the CDC, only drink three cups of water per day, or less.*

Yet 43% of adults in the U.S., according to the CDC, only drink three cups of water per day, or less. Low water intake is connected with impaired immune response, lack of focus, kidney and digestive problems, dry skin, blemishes, slow metabolism, increased blood clot risk and migraines. Sufficient water consumption is associated with mental clarity, better weight control, clearer skin, improved muscle function, enhanced immune response, effective digestion, good kidney health and feelings of wellness.

### Minimizing Cotton Mouth

The unwanted effects of cotton mouth are mainly reduced through being mindful



SALIVARY GLANDS

of oral hydration. When consuming cannabis, regularly, sip on water and if possible maintain proper electrolyte balance.

Eating juicy fruits is recommended. Chewing gum or sucking on hard candy is also recommended by some consumers. One friend has made a ritual of always preparing tea with his cannabis to keep his fluid intake up.

Breathing through one's nose rather than mouth may also be helpful. This is known to reduce moisture loss in the mouth and throat and has helped me deal with cotton mouth. I used to smoke cannabis daily and my sinuses would be constantly congested, making breathing through my nose essentially impossible. I have since switched to only eating and vaporizing it and now my nasal passages are clear. This has significantly allowed me to breathe better through my nose.

Alcohol, caffeine, salt and sugary foods can all contribute to dehydration. Pharmaceutical drugs and medications may also induce dry mouth. Almost two thirds of the most popular prescription drugs list oral dehydration as a side effect. Reducing intake of these substances or drugs may help to alleviate cotton mouth symptoms.

### A reminder to stay hydrated

It's reassuring that cannabis use won't dehydrate us in a way that can be incapacitating (as is the case with alcohol). Next time some surprisingly strong cannabis causes your mouth to feel dry, use it as a reminder to increase your water intake. That way, you can turn a mild symptom into an important health benefit.

### References:

Inhibition of Salivary Secretion by Activation of Cannabinoid Receptors Exp Biol Med (Maywood) September 2006 vol. 231 no. 8 1421-1429

Cannabinoid receptors in submandibular acinar cells: Functional coupling between saliva fluid and electrolytes secretion and Ca<sup>2+</sup> signalling April 15, 2012 J Cell Sci 125, 1884-1895.

Xerostomia: etiology, recognition and treatment

Guggenheimer J, Moore PA Department of Oral Medicine and Pathology, School of Dental Medicine, University of Pittsburgh, Pa PMID:12555958

DOI: 10.14219/jada.archive.2003.0018

Cannabis and caries--does regular cannabis use increase the risk of caries in cigarette smokers?

Schweizer Monatsschrift fur Zahnmedizin = Revue Mensuelle Suisse D'odonto-stomatologie = Rivista Mensile Svizzera di Odontologia e Stomatologia / SSO [2009, 119(6):576-583]

Effect of cannabis usage on the oral environment: a review

PA Versteeg, DE Slot, U Van Der Velden and GA Van Der Weijden

Behaviors and Attitudes Associated With Low Drinking Water Intake Among US Adults, Food Attitudes and Behaviors Survey, 2007

Goodman AB, Blanck HM, Sherry B, Park S, Nebeling L, Yaroch AL. Behaviors and Attitudes Associated With Low Drinking Water Intake Among US Adults, Food Attitudes and Behaviors Survey, 2007. Prev Chronic Dis 2013;10:120248. DOI: Drink Availability is Associated with Enhanced Examination Performance in Adults

Pawson, Chris; Gardner, Mark R.; Doherty, Sarah; Martin, Laura; Soares, Rute; Edmonds, Caroline J.

Psychology Teaching Review, v19 n1 p57-66 Spr 2013

## O'Shaughnessy from previous page

Sharif in Dum-Dum [near Calcutta]. Dr. Sharif healed 13 Europeans through the use of some narcotic-type medicine. It was much less toxic than quinine.

Similarly, a surgeon named Dicken in Balasore treated three Europeans and didn't notice any negative reactions. In the cases where a lot of people hesitate to use Quinine, this can be used safely.

Many members of the Society use rusot for eye inflammations. This medicine is found in all markets. It is extracted from the bark and trunk of a tree called Barberry. It is equivalent to Osisa written about by Greek and Arab authors. O'Shaughnessy used berberine for patients afflicted with fever. For patients afflicted with gonorrhea he used aloe, which is found everywhere in India.

He mentioned a narcotic-type medicine produced from the weed Nux Vomica. This plant is found in abundance in Sylhet. Its local name is 'kuchilaka malong.' Its use in patients afflicted with rheumatism and paralysis is particularly noteworthy. In Cuttuck, its price is one mon per rupee.

### On Indian Hemp

O'Shaughnessy wrote an article about the use of Indian ganja. It described the use of bhang in:

- Treatment of patients inflicted with rheumatism with the use of bhang.

## A well-known person named Amir made majoon in front of O'Shaughnessy quite a few times.

- Treatment of patients inflicted with hydrophobia [rabies]
- Treatment of cholera
- Treatment of tetanus
- A case of deformed limbs

O'Shaughnessy acknowledged those who supplied him with facts about ganja —Said Keramat Ali Mutali of Hooghly's Imambara and Hakim Mirza Abdul Rajes of Tehran, foremost. According to them, during this time ganja was used in contemporary Kabul, Kandahar, and the regions between Sindh and Herat.

He got to know the opinions of ancient Sanskrit pundits from Pundit Madhusudan Gupta. Asiatic society's Pundit Kamlakanta Chakravarty informed him about Hindu plant science. M.D. Kasta provided him data about plant science published in Parsi and Hindi languages. Many contemporary Indians used to mix vegetables, siddhi, and bhang together as a drinkable liquid. During that time, there was a particular process used to make siddhi. Even well-to-do Muslims were familiar with this process.

One of the established processes during that time was to use tobacco mixed with ganja. During that time, majoon or a type of narcotic confection was made by

mixing sugar, butter, flour, milk and sid-dhi or bhang. A well-known person called Amir in Calcutta made majoon in front of O'Shaughnessy quite a few times. In contemporary Calcutta, seven or eight people were familiar with this process.

Customers used to get their majoon made from these people according to their own needs. Contemporary Arabian and Parsi doctors used to think that using majoon for a long time did not lead to bad results such as insanity and infertility. They observed increased appetite and libido...

O'Shaughnessy did not limit himself only within medical science and chemistry. His contribution in transmitting telegraph news through electrical science was unparalleled. In November 1853, the work of the first telegraph transmission was started between Calcutta and Agra, and it ended the following March. In January 1855, the work from Agra to Bombay and Atak was started.

He was an Honorary Fellow of the London Royal Medico-Botanical Society. He was a corresponding member of the Enland Medical Association and Washington's National Institution.

He retired from work in 1862 and on January 22, 1889 he died at 80 years of age.