

## Deepavali Fireworks

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### THE DEEPAVALI AND FIREWORKS CONNECT

#### *A Fiery Debate In Recent Times*

While firecrackers are used on many occasions today in India such as weddings, welcoming of dignitaries, victory in sports, matches and elections, get-togethers, Christmas, New Year and other festivals and celebrations, it has for long been primarily associated with the Deepavali festival.

However in recent times many have started debating on whether it is right to celebrate using fireworks which end up polluting and also causing accidents and it is often Deepavali which gets targeted since one cannot imagine a Deepavali without fireworks.

The answer to this debate lies in examining,

- [How firecrackers form part of Deepavali tradition?](#)
- [Are firecrackers native to India?](#)
- [How far back does the tradition go?](#)

### FIREWORKS - A PART OF DEEPAVALI TRADITION

To examine this tradition and inseparable connect between Deepavali and fireworks, one has to first understand the deep culture of India and some of its customs, atleast the ones connected with Deepavali and Fireworks. They being,

- Incarnation of Divine
- Reincarnation of mortals
- Cremation of the dead
- Upholding of *Dharma*.

#### *Incarnation of Divine*

Indian history can be traced all the way back to the times of 2 important heroes of India and beyond,

1. Rama of Ayodhya, the son of King Dasaratha, who lived 7100 years ago
2. Krishna of Dwaraka, the son of the noble Vasudeva, who lived 5100 years ago.

These 2 historic personages of India have also been held as incarnations of the Divinity Vishnu.

Vishnu is known for the number of incarnations, *Avatars* taken, in order to keep everything working in order and free of negative forces and wrongs. Such incarnations have been called *Avatar*, meaning “a stepping down” for, in an *Avatar*, the infinite consciousness and unbound powers of that Divine force “descends down on earth” in a physical form taken in the incarnation. An *Avatar* is both historic and Divine as the *Avatar* form embodies the Divine force that the *Avatar* descends from.

Every *Avatar* has a purpose and that of Rama and Krishna was to re-emphasize living by *Dharma*, the principles of living righteously, in line with one's nature, role, society and surroundings. During their *Avatar* life, as part of their mission, they also vanquished many who had strayed from the path of *Dharma* and were becoming a threat to society and the very practice of *Dharma* itself.

In the case of Rama, such cleansing was achieved with Rama vanquishing Ravana and many other *Rakshasa* and *Asura* prior to that.

In the case of Krishna, besides playing a key role in the Kurukshetra war between the *Pandava* and the *Kaurava* to ensure the victory of *Dharma*, Krishna also brought about cleansing in society in a multifold manner – through Bhagavad Gita *Upadesha* and other teachings and also by vanquishing Kamsa and many other *Rakshasa* and *Asura* sent by Kamsa as well as *Narakasura*, who used to torment people and had imprisoned several maidens since it was prophesied that he would meet his end at the hand of a woman.

### **Reincarnation of mortals**

If it was incarnation for the Divine force, Vishnu, it was reincarnation for mortals and others, who have taken births and rebirths at different times, as different beings with different characters based on their cumulative goodness / badness. Thus while Vishnu was incarnated as Rama and Krishna, many others were reincarnated as various *Rakshasa*, *Asura* and *Manava*. The ones with higher goodness ended up on the side of the *Avatars* while the others ended up meeting their ends at the hands of the *Avatars*.

Ravana and Narakasura are the most prominent cases of those who were unfortunate to have been born on the wrong side of the *Avatar* but at the same time were fortunate enough to have the supreme Divine force itself descend to vanquish them and to meet their ends at the hands of the *Avatars* themselves.

### **Cremation of the Dead**

It is perhaps a custom, unique to the Indian civilization, that the dead are cremated using fire rather than buried or consigned to other elemental forms.

It is also a custom to bathe from head to toe, after bidding farewell to the dead or attending a funeral or cremation or even visiting a house in mourning. The idea is to disassociate oneself from the soul of the dead, thereby releasing the soul of the dead individual from all earthly bonds and bondages.

On the contrary, an oil bath is synonymous with celebrations and is taken usually on auspicious occasions, wedding day, birthday etc.

### **Upholding of Dharma**

History in India has had a different purpose as compared to the west. The objective was more to set role models and learn from the past on how to uphold *Dharma*, than to merely chronicle the sequence of events and life story of important heroes and personages.

To keep such history alive, Indian tradition is replete with festivals to mark some of the momentous events in history. The death of Ravana and Narakasura at the hands of Rama and Krishna with Satyabhama respectively form some of the key anchors to the celebrations in India. Death of Ravana is celebrated as *Vijaya Dasami* during the *Sharadiya Navaratri* and death of Narakasura is celebrated as *Naraka Chaturdashi* and one of the days of *Deepavali*.



**Narakasura slain by Satyabhama and Krishna**

### ***Fireworks – An Amalgam of Above Customs***

Combining all the above aspects of Indian thought, belief, custom and philosophy, restoration of *Dharma*, especially brought about by the death of significant violators at the hands of the Divine, have been celebrated by the use of fire to symbolize the funeral and cremation of the tormentor as well as celebration and reverberation of the message in the defeat of the tormentor.

We thus have had

- effigies of Ravana filled with firecrackers burnt as part of *Vijaya Dasami* celebrations
- effigies of Narakasura filled with firecrackers burnt as part of *Naraka Chaturdasi* celebrations.

While the *Ravana Dahan* has stayed alive in the Northern belt of India, the idea of *Naraka Vadam* has stayed alive in the Southern belt of India.

The festivities of *Ram Lila* are widely popular in North India while the *Naraka Chaturdasi* celebrations can be seen mainly in South India.

### ***Significance of Naraka Chaturdasi***

In many parts of India such as South India, Goa, Rajasthan and also Nepal, the highlight of the celebration of the Diwali festival season of 6 to 7 days even in present times is the *Naraka Chaturdasi*, i.e. 14<sup>th</sup> phase of the waning moon, the day on which Narakasura was vanquished by Krishna and his wife Satyabhama, which is celebrated as Deepavali.

Indian ethos recommends a 4 step method towards punishing wrong, namely

1. *Saama* - balanced education,
2. *Dhaana* - incentivising good behaviour,
3. *Bhedha* - discrimination to kindle the conscience,
4. *Dhanda* - punishing to evoke conformance.

The same Indian ethos also recognizes a 3 step approach to forgiving, namely

1. Realizing – becoming aware that one has wronged
2. Repenting – feeling remorseful for the wrong doing
3. Atoning – wanting to set right the wrong done or willing to undergo punishment.

Each frame of mind of the wrong doer has attracted suitable levels of punishment / forgiveness.

In the case of Narakasura, in his dying moments, it was Narakasura's prayer to Krishna that even though he had been a tormentor of people and wronged many in his life, may his atonement by death, usher in, wellbeing and prosperity for all. He was willing to undergo suffering if people would be granted prosperity.

Krishna therefore as an act of pardon, granted him his dying wish. He also granted him immortality in people's memory through celebrations of his death annually as *Naraka Chaturdasi*, a day of victory, so that his message of atonement and prayer for other's wellbeing, even during times of one's suffering, lingers in people's minds forever in the form of *Deepavali* celebrations.

Krishna lived 5100 years ago. It has thus been a 5100 year old tradition in India of celebrating this day in the *Deepavali* season as a day auguring good, with the celebration of the conquest of a tyrant and recollection of the lesson he taught of praying for others' wellbeing even during moments of suffering as atonement.

### *Naraka Chaturdasi and Fireworks*

Since funeral implies burning on a pyre with fire, a dancing fire like that of fireworks have been used to symbolize a funeral occasion which is also a celebration.

Bursting of firecracker, even just one with sound, is a sign of the slaying of Narakasura.

After the death of Narakasura, it would have been customary for the people to have a head bath. But since it was a joyous occasion too, instead of a simple head bath, it acquired the ritual of an oil bath as a sign of celebration too.

Thus has come the tradition of an oil bath on Naraka Chaturdashi, after bursting cracker or the slaying of Narakasura, as a sign of death of a tyrant which is a celebration.

People have been ushering in Deepavali since then, by the bursting firecrackers at dawn and then going and taking an oil bath as is the Indian custom to bathe after a funeral. It is an oil bath in this case, since his death is a celebration than mourning.

*Naraka Chaturdasi* has thus been celebrated all across India.

### **Goa's Naraka Chaturdasi**

In Goa this celebration, even today, takes the form of an effigy of Narakasura made with combustible materials such as papers, straw, wood chips and filled with firecrackers which is burnt as a sign of his funeral. Each community makes their own effigy over several days. In Goa too, this burning is followed by the traditional oil bath ritual.



**Effigy of Narakasura in Goa**

Photo Source – Photo by Gouthami for the article in UnTravel Festival Special of The Alternative.in

### **Nepal's YamPanchak**

Nepal and the states of Assam, Sikkim and some parts of West Bengal, celebrate the entire Deepavali season as a 5 day festival called *YamPanchak* i.e. the 5 days of Yama, the Divinity for Death. *Yam* also means to control / regulate.

*Yampanchak* is also called *Tihar*, a variation of the word *Tyauhar* meaning festival in Hindi

Each day of *Tihar* or *Yampanchak* is related to animals such as Crow, Dog, Cow and Ox. Each of these animals has a close connect with Yama, the Divinity for Death, a theme we see repeating here.

### **Bengal's 14 Lamps And Cuisine**

In the East, especially in Bengal, 14 lamps are lit and the cuisine also comprises 14 different kinds of green vegetables to signify that it is a *Chaturdasi* and stress the significance of the day as *Naraka Chaturdasi*.

### **Gujarat's Kali Chaudas**

In Gujarat, the day of *Naraka Chaturdasi* is celebrated as *Kali Chaudas*. *Chaudas* means 14, the same as *Chaturdasi*, to denote the 14<sup>th</sup> phase of the moon.

*Kali Chaudas* is the day to throw away all laziness which comes from the humor in one's body, called *Tamas*. Since *Tamas* is also darkness this day acquired the name *Kali Chaudas*.

It is very interesting to note the metaphor in the legend of Narakasura and *Kali Chaudas*. Narka took away Aditi's earrings. Aditi was the wife of Kashyapa, the progenitor of all living beings. One of the wives of Kashyapa was also called Tamra and one of Kashyapa and Tamra's daughters was *Kaki*, the mother of crows and owls and Crow is black or *Kala*.

In a simple perspective, *Kali Chaudas* is also the *Chaudas* in the waning, dark, *Kali* fortnight.

### **Rajasthan's Roop Chaudas**

In Rajasthan, *Naraka Chaturdasi* is celebrated as *Roop Chaudas* or *Soundarya Siddhi Divas* where people stress on the art of looking beautiful. They take efforts to take oil bath, apply *ubtan*, which is a fragrant paste of gram flour, turmeric, sandal and other fragrances and they meditate to develop a glow to their persona.

One can see here that more than the death of Narka and bursting of firecrackers, it is the oil bath ritual which has taken centre stage in Rajasthan.

### **Oil Bath and Festivities**

The moot question is "Why take oil bath for celebrations?".

The answer can be found in *Charaka Samhita*.

***The body of one who uses oil massage regularly does not become affected much even if subjected to accidental injuries, or strenuous work. By using oil massage daily, a person is endowed with pleasant touch, trimmed body parts and becomes strong, charming and least affected by old age.***

**-Charaka Samhita Vol. 1, V: 88-89**

An oil massage and bath seems to be the right thing to do after exposing oneself to bursting firecrackers and after having sustained burns if any. Likewise, any festivity also implies strenuous activity and an oil massage seems to be a prophylactic measure for the same.

### ***No Fireworks with Holi***

Another instance of a festival with fire is Holi where a bon fire is lit to symbolize the fire in which Holika, the sister of the *Asura* king, Hiranyakashipu was burnt while attempting to burn Hiranyakashipu's son Prahalada who was an ardent devotee of Vishnu.



**A Holi Bonfire**

However in the festival of Holi, it is only celebrated as a bon fire and not in the form of setting fire to an effigy since this was not a case of re-enacting a cremation of Holika. For, while Ravana and Narakasura were killed by the *Avatar* of Vishnu and then cremated, it was not a cremation of Holika. She was burnt by the fire she had created herself.

### ***The Take Away From Naraka Chaturdasi***

This message that even as one goes through the difficulties of life and even while facing tough times, one should have the graciousness to wish the others goodness / well has been transmitted, generation after generation, on the occasion of *Deepavali* as the core ethos of the *Deepavali* celebration. While wishing well for others, one also tends to forget one's problems and embraces happiness, positivity.

This thought of spreading joy, happiness among people, even when one is personally in difficulty or misery, denotes a high level of nobility and personal character of being an evolved human and formed the ethos of the Indian civilization for millennia.

### ***Not Just Victory of Good Over Evil in Indian Thought But More***

This should set straight the notion that all Indian festivals are merely a celebration of victory of good over evil. Indian thought did not see the world in a binary state of good or evil or black and white

alone. All shades of grey lie in between. Even the vilest tormentor can be graced by the Divine, can set a good example and can become immortalized in memory and celebrated.

A similar case is the instance of Ravana, who, even after being mortally wounded by Rama, offered to teach Rama's brother Lakshmana, all that he knew about the principles of good management.

### ***Celebration through Crackers***

The use of crackers as a part of the celebration also brings out this noble feeling for sharing through sound and light with one's *bandhu* and *mitra* i.e. those with whom we have a bond - our family, our *Bandhu* (similar to bond) and friends in the neighbourhood, far and near. It is an activity to also increase the bonding further.

### ***Deepavali And Fireworks Association***

The above, continuous tradition of *Naraka Chaturdasi* ties fire and firecrackers to Deepavali festivities inseparably.

From this celebration, the idea of using firecrackers to celebrate all victories, happy occasions, other festivals and so on came to be sparked.

Let us now trace back the knowhow and displays of firework in India, across the land and across times.

## **"BURSTING" MYTHS AROUND ORIGIN OF FIREWORKS**

### ***Saltpetre – the Key Spark***

One of the main constituents of fireworks, pyrotechnics is Potassium Nitrate ( $KNO_3$ ), commonly called SaltPetre, but more popular as Bengal SaltPetre, though in recent times it is also replaced by Barium and other Nitrates for greens and other colours. Some even refer to this salt as Chinese Salt or Chinese Snow, attributing its origin to China.

It is a form of potash found organically in soil rich in nitrogen. The knowledge, usage and trade of this salt has a long history in both India and China.

### ***Commonly Held History of Fireworks***

In international circles it is widely believed that the technology for producing Saltpetre which is key to Fireworks and Gunpowder, was discovered in China. This perception has come about mainly due to the works of British Sinologists such as Joseph Needham.

To summarize world history of Saltpetre and ensuing Fireworks, gunpowder and guns –

- A concoction that could emit dancing light and fire is traced to Wei Boyang of the Han Dynasty in China in 142 CE.
- Further development of this technology into Gunpowder for warfare is traced to Tang Dynasty during 700 CE.
- Development of rockets for warfare using gunpowder is said to have followed by 900s CE in China.
- Travel of all these technology to Persia, Central Asia and Russia etc. is traced to 1100s CE.
- After this point it is believed to have travelled to Rome, France, Germany and then UK by which time it had developed into guns and other forms of explosives and firearms.



The early part of the 2<sup>nd</sup> Millennium CE, thus saw the evolution of various forms of fireworks display ranging from naphtha throwing by the Byzantians and Arabs, the usage of green bamboo to crack and produce loud noise when thrown in fire as used by Chinese.

### Common Misperception of Fireworks Being Foreign to India

The knowledge of this organic chemical, its application as an explosive and ways of extracting it in India, are claimed to have been developed in India, after the development of firing weapons in Persia and the West.

However, local Indian texts display its usage in the form of fireworks and pyrotechnics across at least 2 Millennia. Much about this product and technology can also be gathered from records of the British.

### A British Observation

<p>Supply. Conditions of Formation.</p>	<p><i>Labor. Ind. Mus.</i>, 1902-3, 23-4 ; 1903-4, 37 ; also <i>Agri. Ledg.</i>, 1905, No. 3. The term Saltpetre is used to designate nitrates found in a natural state in many parts of the world, chiefly South America, Spain, Persia, Hungary and India. In the last-mentioned country the salt bears the following vernacular names :—<i>suriakhar</i>, <i>shóra</i> (<i>sórá</i>), <i>potti-luppu</i>, <i>veti-uppa</i>, <i>sandawa</i>, <i>yánzin</i>, etc. <i>Shóra</i> is its Persian name Sanskritised into <i>soráka</i>.</p> <p><b>Occurrence.</b>—According to Holland, the necessary conditions for the formation of saltpetre in a soil are—“(1) supplies of nitrogenous organic matter ; (2) climatic conditions favourable to the growth and action of Winogradsky’s so-called nitroso- and nitro-bacteria, converting urea and ammonia successively into nitrous and nitric acids ; (3) the presence of potash ; and (4) meteorological conditions suitable for the efflorescence of the potassium nitrate at the surface.”</p>
<p>Climatic Conditions.</p>	<p>The necessary combination of characters is to be found in a marked degree in various districts in the Indo-Gangetic tract, especially in the Bihar section, chiefly Gaya, Tirhut, Saran and Champáran. “In this part of India we have a population of over 500 per square mile, mainly agricultural in occupation, and thus accompanied by a high proportion of domestic animals, supplying an abundance of organic nitrogen. With a mean temperature of 78° F., confined to an annual range of 68°, and for a large part of the year, when the air has a humidity of over 80 per cent., with a diurnal range not exceeding 8° above or below 84° F., the conditions are unusually favourable for the growth of the so-called ‘nitrifying’ bacteria.”</p>
<p>Chief Localities.</p>	<p>“With a population largely using wood and cow-dung for fuel, the soil around villages naturally would be well stocked with potash ; and finally, with a period of continuous surface desiccation following a small rainfall, the subsoil water, brought to the surface by capillary action in the soil, leaves an efflorescence of salts, in which, not surprisingly, potassium nitrate is conspicuous. Under these conditions Bihar has for many years yielded some 20,000 tons of saltpetre a year” (Holland, <i>l.c.</i> 86-7). To a less extent commercial saltpetre is also obtained in the United Provinces</p>

Extract from Pg.972 from “The Commercial Products of India” by Sir George Watt, 1908, Being An Abridgment Of “The Dictionary Of The Economic Products Of India”

### The Saltpetre Influence

Arriving in India in search of precious goods such as steel, cotton, silk, indigo, saltpetre etc., Europeans first started trade on the East Coast and slowly moved to the west coast and set up factories for the same in India for large scale exploitation of the raw materials available in plenty in India. One of the first to set up a Saltpetre factory were the English, at Surat, in 1607 based on a *firman* from Mughal Emperor Jahangir. This was subsequently renewed by Prince Khurram, Shahjahan and Aurangazeb.

It was during Jahangir's reign that the first English envoy reached the Mughal court and received a royal *farman* in 1607. when the English established their first factory at Surat.

Extract from The Pearson Indian History Manual for the UPSC Civil Services Preliminary Examination, Second Edition, Pg B172

From such records we can further gather that the Dutch meanwhile got *firman* from Jahangir in 1638 to start trade in Saltpetre, indigo and other commodities from West Coast and they also chose Surat as their base for trade.

Thus Surat became one of the prime manufacturing and trade centre for Saltpetre for Europe from West and Masulipatnam was the centre from the East. By the 18<sup>th</sup> century, around 1750s, due to pressure from Turkey, the Mughals were forced to clamp down on trade of Saltpetre to Europeans and Surat lost its stronghold. The English subsequently shifted their production and trade to the East, from Bengal, using Hooghli as the lifeline for this trade.

Thus Saltpetre from India has been one of the key items that has influenced world trade, colonization of Asia as well as brought the fierce drama between Europe and the Turks to the doorstep of India to influence the equation between the Mughals and the British, Dutch, French and the Portuguese during the 1600s and 1700s.

### A Misreading of Names

It is interesting to read what the "Dictionary Of The Economic Products Of India" itself had to say with regards to the history of this Saltpetre.

cons. is a synonym of *Sarjika* and not a separate article. Some recent Sanskrit formulæ for the preparation of mineral acids containing nitre mention this salt under the name of *Soraka*. This word, however, is not met with in any Sanskrit dictionary, and is evidently Sanskritized from the vernacular *Sorá*, a term of foreign origin. The manufacture of nitre was, therefore, most probably introduced into India after the adoption of gunpowder as a material of warfare. It is necessary to observe here that many writers have erroneously translated nitre into the Sanskrit term *Sarjika*. This last however is not a nitrate but an impure carbonate

Extract from Pg 432 of "The Dictionary Of The Economic Products Of India" by George Watt, Vol 6, Part II, Sabadilla to Silica, 1893

We see that, according to the British, the word commonly used in Bengal and Bihar for this Saltpetre was *Soraka* and the British attributed this word to be of foreign origin.

### A Tamil Reading

Going back by more than 2000 years, one finds Tamil texts of the Siddha/ Siddhar called Bogar. Bogar is renowned for his famous work *Bogar Ezhayiram*, meaning "7000 verses of Bogar".

In verse 419 of the second set of 1000 verses, of his overall 7000 verses, Bogar lists ingredients used to make distillations which are essential for making *Sarakku Vaippu*.

*Sarakku* in colloquial Tamil means stuffs, drugs, spices, goods, commodities, articles of merchandize, wares.

In Tamil slang, *Sarakku* also means liquor which has been distilled crudely.

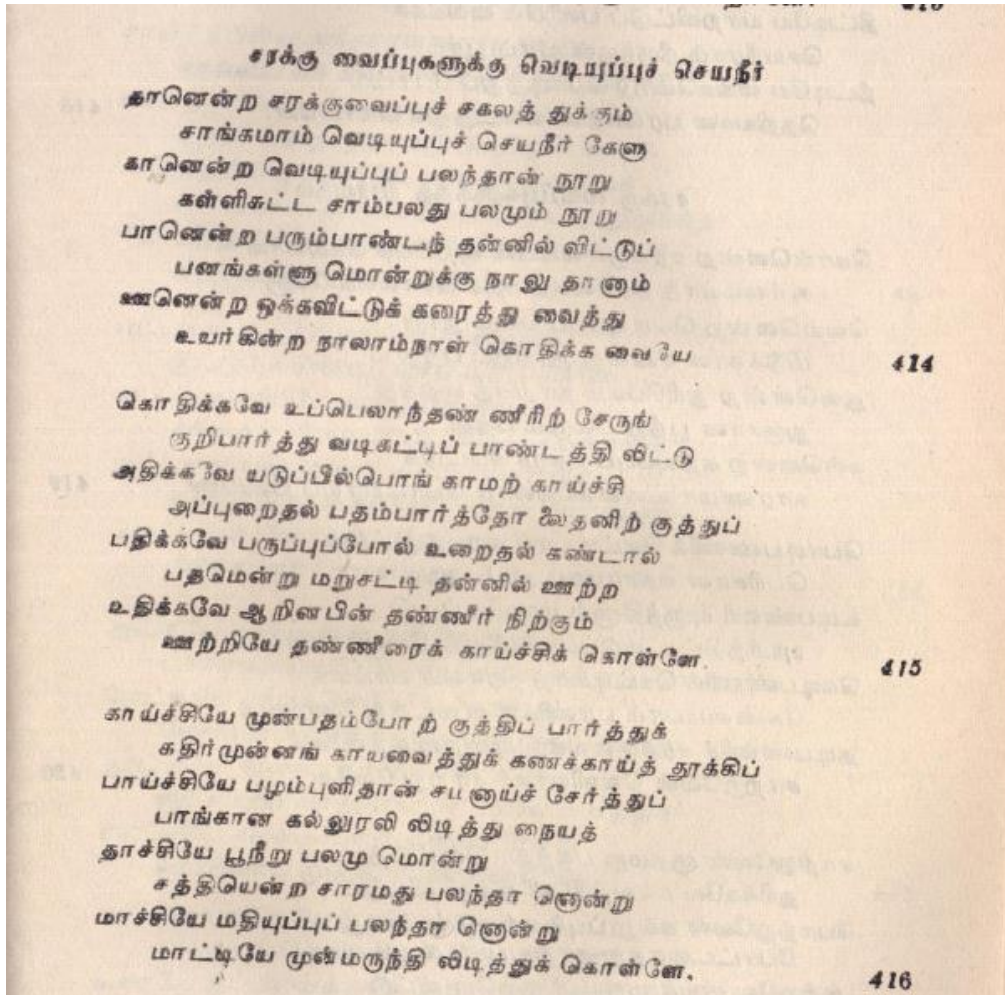
But *Sarakku* in Tamil chemical parlance also means minerals used for medicine especially arsenic, materials which are half in their native state and half prepared and also alkalis and salts used in the chemical preparation of medicines etc. Perhaps it is this definition which gave rise to the slang word *Sarakku* for liquor too.

*Vaippu* means deposit or residue.

*Sarakku vaippu* denotes a specific type of compound created by the mixing of chemicals and Bogar emphasizes usage of Saltpetre solutions for these. He refers to Saltpetre as white *Vediuppu* (i.e.explosive salt). *Vedi* means explosion and *Uppu* means salt.

### Same process across 2000 years

In the previous set of verses, 415 to 418, Bogar describes the method of preparing the Saltpetre solution, *Vediuppu Cheyaneer* for all types of *Sarakku Vaippu*, of which firework, rocket powder, gunpowder etc. are one kind.



Snapshot of the verses starting 414 from Bogar7000 2m Kaandam (the 2nd 100 from Bogar's 7000)

Source –Publication Division of “Arulmigu Pazhani Dandayudaswami Thirukoil Siddhamarutuva Nool”, Palani

Infact by using the prefix *Vedi*, “explosive”, to the word salt, *Uppu*, he clearly distinguishes this *Vediuppu*, Saltpetre with its explosive property from other salts to be used, namely

- black salt called *Kariuppu*, charcoal / carbon containing salt
- rock salt, referred to as *madiyuppu* or *induppu*, same as *Senda Namak* in Hindi or *Saindava Lavanam* in Samskrt

Bogar also mentions addition of *Thurisu*, which are crystals of bluish green, copper sulphate, commonly used to dissolve corns in foot soles.

Coming to see, we find that these 3 ingredients – Potassium Nitrate (KNO<sub>3</sub>), Sulphur and Charcoal indeed form the basic ingredients of most explosives, even today.

Common Salt or Sea salt, is referred by him as *kalluppu* from *kal* meaning rock, since sea salt used to be commonly used in the form of rock crystals.

The steps mentioned in verses 414 onwards are exactly similar to what Sir George Watt has described as being followed by the organic Saltpetre manufacturers of Bihar and rest of India, to the extent of boiling, checking for consistency, cooling, waiting till sunrise for the unrefined Saltpetre crystals and for refined Saltpetre, boiling further, removing the scum, placing frames for crystals to form, waiting for 4 days as per Bogar and 7 days as per George Watt’s observation in Bihar.

### ***From Sarakku to Shoraka***

One read of the process described in chaste Tamil, in poetic and alliterative style, will quell all doubts regarding the origin of this knowledge - that it could not have been anything but original thought and not a translation of a foreign knowledge.

Furthermore, it is common knowledge how “a” becomes “o” phonetically when the word moves from rest of India to regions of Bengal and Bihar. Infact the very word *Vanga* for Bengal, is pronounced as *Bongala* in the languages of east India.

It is natural then for *Sarakku* in Tamil to also become *Shorak /Shoraka* in Bengal.

It is further interesting how the Siddhar, Bogar describes addition of Palm Liquor to the boiling solution and how George Watt describes the liquid in this process as a liquor.

*Sarakku* in Tamil also means wares for trade, which Saltpetre definitely was.

Bogar had travelled to China and Arabia according to the literature on the Siddhar and along with him his knowledge of Chemistry for Medicine and Fireworks would have travelled too.

This clearly places *Shoraka*, *Shora* for Saltpetre, as not a foreign word or a foreign knowhow but very much, a word of the Indian civilization and a native knowledge and technique of making *Sarakku*.

### ***India as home of Saltpetre and Fireworks***

Yet another angle to confirm that India had to have been the originator for fireworks, lies in the very description by the British of regions where such Saltpetre occurred naturally, as seen in extract earlier,

*“...chiefly South America, Spain, Persia, Hungary and India”.*

While other regions of the world are listed, China is not listed by them even though the British's interactions and knowledge of China were well established by then.

This is further confirmed by the records of exports of Saltpetre from India to China even in 1900s.

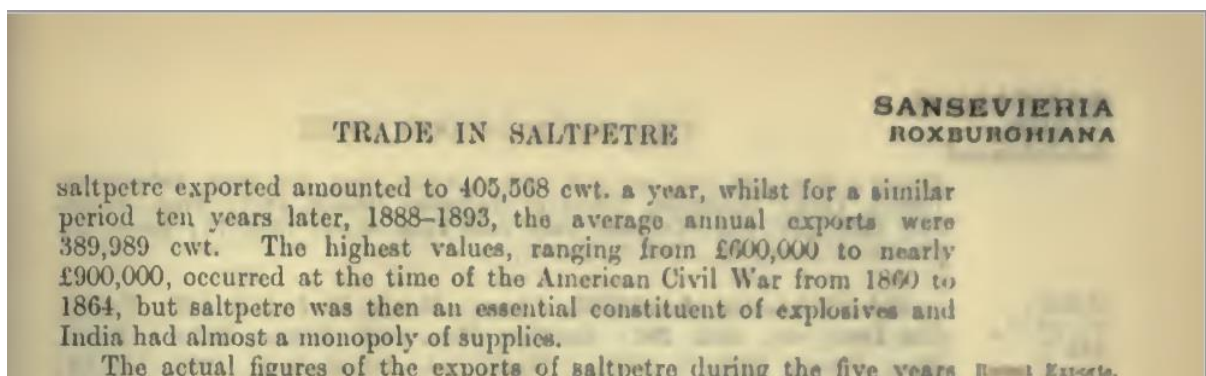
<i>Products of India.</i>						445
Trade in Saltpetre						(J. Watt.) SALTPETRE.
years, so as to exhibit the more important countries to which the Indian saltpetre is usually exported :—						TRADE. Exports.
Countries to which exported.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	
United Kingdom . . . . .	195,206	158,503	176,470	192,051	167,052	
United States . . . . .	90,882	86,045	61,111	61,382	90,981	
Hong-Kong . . . . .	60,431	79,074	90,137	104,437	76,872	
France . . . . .	33,766	50,900	36,516	32,319	34,949	
Straits Settlements . . . . .	7,539	8,202	7,697	12,462	17,929	
Australia . . . . .	4,242	985	2,285	1,285	895	
Belgium . . . . .	3,443	4,333	1,002	1,143	...	
All other countries . . . . .	...	...	...	5	11,851	
<b>TOTAL</b> . . . . .	<b>402,174</b>	<b>397,572</b>	<b>386,396</b>	<b>420,503</b>	<b>422,229</b>	

The United Kingdom thus takes by far the largest amount and is followed by the United States, then by China, France, the Straits, Australia, etc. Mr. J. E. O'Connor, commenting on the fluctuations of the exports, says—

Table Extracted from Pg 445 of "The Dictionary Of The Economic Products Of India" by George Watt, Vol 6, Part II, Sabadilla to Silica, 1893

Records further state that the exports of Saltpetre touched the highest during the American Civil wars, between 1800 and 1860s. Saltpetre to the excess of 650000 Pounds of value was exported to America then.

British records of those times show how India was seen as a monopoly supplier of Saltpetre for the world.



Extract from Pg.975 from "The Commercial Products of India" by Sir George Watt, 1908, Being An Abridgment Of "The Dictionary Of The Economic Products Of India"

So, between India and China, one can see India being naturally ordained to produce Saltpetre, a fact that they had leveraged well to gain monopoly across millennia.

### ***A Fair Conclusion***

After extensive research on the origins of Gunpowder and guns, Dr.Gustav Oppert, an Indologist from Germany, debunks the popular claim in the west that Gunpowder was first invented in Freiburg, in 1330 by the Franciscan monk, Berthold Schwarz, earlier called Constantine Anklitz. Not only does Dr.Oppert debunk its origin in Germany, he traces its mention to the ancient Indian text *Sukraniti* and concludes how, even between India and China, the origins of Gunpowder can be safely attributed to India. To quote,

*“No Chinese work on this question can, with respect to antiquity, be compared to Sukraniti, so that even if the Chinese should have independently invented gunpowder, the claim as to the priority of invention will certainly remain with India.”*

- Article “Gunpowder Originated in Ancient India” by Dr.Gustav Oppert, in Political, Legal and War Philosophy in Ancient India by H.S.Bhatia.

### ***The Final Word – Kautilya’s Arthashastra***

The clincher for India having had knowledge, access and practice of using explosives comes from *Arthashastra*, the manual on Administration, authored by Kautilya, also known as Chanakya, around 300 BCE.

In this work he advises of methods in which to ambush and defeat an enemy king or points to address while constructing a fort so that arms and ammunition can be stored safely and securely.

### Construction of a Fort - Durgavidhana

59.5

**Agnisamyogaha  
Explosives**

तासु पाषाणकुडालकुठारीकाण्डकल्पनाः ।  
 मुसृण्ठि<sup>4</sup>मुद्गरां दण्डचक्रयन्त्रशतघ्नयः ॥  
 कार्याः कार्मारिकाशूला वेधनाग्राश्च वेणवः ।  
 उष्ट्रग्रीव्योऽग्निसंयोगाः कुप्यकल्पे च योऽवधिः ॥  
 इत्यध्यक्षप्रचारे द्वितीयेऽधिकरणे दुर्गविधानं  
 तृतीयोऽध्यायः । आदितश्चतुर्विंशः.

its external area one-and-a-half times as broad as that of its innermost room; a circular building with an arch way; and in accordance with available space and materials, there shall also be constructed canals (*kulyá*) to hold weapons and three times as long as broad.

In those canals, there shall be collected stones, spades (*kuddála*), axes (*kuthári*), varieties of staffs, cudgel (*musrinthi*), hammers (*mudgara*), clubs, discus, machines (*yantra*), and such weapons as can destroy a hundred persons at once (*sataghni*), together with spears, tridents, bamboo-sticks with pointed edges made of iron, camel-necks, explosives (*agnisamyógas*), and whatever else can be devised and formed from available materials.

[Thus ends Chapter III, "Construction of Forts," in Book II, "The Duties of Government Superintendents" of the *Arthasástra* of Kautilya. End of twenty-fourth chapter from the beginning.]

Last Verse in Book 2, Duties of Govt Superintendents, Chapter 3 – Durgavidhana, Building a Fort, *Durg*

From: Kautilya's Arthashastra. Translated into English by R. Shamasastri, Bangalore: Government Press, 1915, 515-520.

### Duties of a Superintendent of a Ship - Navadhyaksha

#### **Weapons & Explosives**

परस्य भार्या कन्यां वित्तं वाऽपहरन्तं शङ्कितमाविग्रमुद्राण्डी-  
कृतं महाभाण्डेन मूर्ध्नि भारेणावच्छादयन्तं सद्योगृहीतालङ्घिनं  
अलिङ्घिनं वा प्रव्र<sup>२</sup>जितमलक्ष्यव्याधितं भयविकारिणं गूढसारभा-  
ण्डशासनशस्त्राग्नीयोगं विषहस्तं दीर्घपथिकममुद्रं चोपग्राहयेत् ।

Any person who is abducting the wife or daughter of another, one who is carrying off the wealth of another, a suspected person, one who seems to be of perturbed appearance, one who has no baggage, one who attempts to conceal, or evade the cognisance of the valuable load in one's hand, one who has just put on a different garb, one who has removed or renounced one's usual garb, one who has just turned out an ascetic, one who pretends to be suffering from disease, one who seems to be alarmed, one who is stealthily carrying valuable things, or going on a secret mission, or carrying weapons or explosives (agniyoga), one who holds poison in one's hand, and one who has come from a long distance without a pass shall all be arrested.

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Verse in Book 2, Duties of Govt Superintendent, Chapter 28 – Naavadhyaksha i.e Superintendent of Ship , Pg 181

From: Kautilya's Arthashastra. Translated into English by R. Shamasastri, Bangalore: Government Press, 1915, 515-520.



## Spies with Weapons, Fire and Poison

### Yogagnidhoomaabhyam Fire & smoke from explosives

दण्डचारणः सत्रापाश्रयस्तम्भवाटापाश्रया वा हन्युः । लुब्ध-  
कव्यञ्जना वाऽवस्कन्दसङ्कुलेषु गृहयुद्धहेतुभिरभिहन्युः । एका  
यने वा शैलस्तम्भपटखञ्जना<sup>1</sup>न्तरुदके वा स्वभूमिवलेनाभिहन्युः।  
नदीसरस्तटाकसेतुबन्धभेदेवेगेन वा प्लावयेयुः । धान्वनवनदु-  
र्गनिम्नदुर्गस्थं वा योगाग्निधूमाभ्यां नाशयेयुः । सङ्कटगतमाग्नि-  
ना, धान्वगतं धूमेन ; निधानगतं रसेन ; तोयावगाढं दृष्टग्रा-  
हैरुदकचरणैर्वा तीक्ष्णास्साधयेयुः । आदीप्तावासात् निष्पत-  
न्तं वा—

<sup>1</sup> स्तम्भवनाखञ्जना.

treacherous fights. Or occupying an advantageous position, they may slay the enemy when he is marching in a narrow path passable by a single man, or on a mountain, or near the trunk of a tree, or under the branches of a banian tree, or in water; or they may cause him to be carried off by the force of a current of water let off by the destruction of a dam across a river, or of a lake or pond; or they may destroy him by means of an explosive fire or poisonous ~~snake~~ smoke when he has entrenched himself in a fort, in a desert, in a forest, or in a valley. He should be destroyed with fire when he is under a thicket; with smoke when he is in a desert; with poison when he is in a comfortable place; with crocodile and other cruel beasts when he is in water; or they may slay him when he is going out of his burning house.

Verse in Book 12, "Concerning a Powerful Enemy", Chapter 4 "Spies with Weapons, Fire and Poison and Destruction of Supply, Stores and Granaries," Pg 557

From: Kautilya's Arthashastra. Translated into English by R. Shamasastri, Bangalore: Government Press, 1915, 515-520.

### Capture of an Enemy using Secret Contrivances

**Rasagniyogena  
Explosive  
substances**

दूष्यव्यञ्जनैर्निष्पत्य गूढसैन्योऽभिहन्यात् । एवं गृहीतदुर्गे वा  
प्राश्य प्राशं चैत्यमुपस्थाप्य दैवतप्रतिमाच्छिद्रं प्रविश्यासीत् ;  
गूढाभित्तिं वा दैवतप्रतिमायुक्तं वा भूमिगृहम् । विस्मृते सुरङ्गया  
रात्रौ राजावासमनुप्रविश्य सुप्तमित्रं हन्यात् । यन्त्रविश्ले-  
षणं वा विश्लेष्याधस्तादवपातयेत् । रसाग्नियोगेनावलिप्तं गृहं 473'4  
जतुगृहं वाऽधिशयानममित्रमादीपयेत् । प्रमदवनविहारणामन्य-

<sup>1</sup> स्नेहक्षारो.      <sup>2</sup> तदमुष्मिन्दुर्गे वाध्यं स्नेहक्षारो लवणं वा तदमुष्मिन्.

sacramental food and setting up an altar; or he may lie in a secret hole in a wall, or in a hole made in the body of an idol in an underground chamber; and when he is forgotten, he may get out of his concealment through a tunnel, and, entering into the palace, slay his enemy while sleeping, or loosening the fastenings of a machine (*yantra*), he may let it fall on his enemy; or when his enemy is lying in a chamber which is besmeared with poisonous and explosive substances or which is made of lac, he may set fire to it. Fiery spies, hidden in an underground chamber, or in a tunnel, or inside a secret wall, may slay the enemy when the latter is carelessly amusing himself in a pleasure park or any other place of

Verse in Book 12, "Concerning a Powerful Enemy", Chapter 5 – "Capture of an Enemy using Secret Contrivances or by Means of the Army; and Complete Victory," Pg 561

From: Kautilya's Arthashastra. Translated into English by R. Shamasastri, Bangalore: Government Press, 1915, 515-520.

From the above verses, we see that in 300 BCE itself, there was a clear distinction and mention of explosives and fire from explosives in many instances in Kautilya's *Arthashastra*. This confirms the popularity of the knowhow for explosives, the basic ingredient in a firework, as well as the application of the same, much before China's Wei Boyang mentions it in 142 CE.

Further more, explosives have been mentioned distinctly, versus other causes for Fire.

Also we can see that, explosives here have been mentioned in the context of warfare and not entertainment.

This traces explosive and fireworks in India to atleast 300 BCE.

### ***Myths Around Firecrackers - Cracked***

The above analysis clearly puts to rest misconceptions such as,

- Fireworks are not native to India
- Fireworks were invented by China and made their way to India, even as cheaper versions do today
- Fireworks are only as recent as Persian / Mughal influence in India
- Fireworks were brought to India by the British
- Fireworks are not innate to Indian way of festivities.

One can see that,

- not only have fireworks been a part of the main Indian festival Deepavali for ages,
- but fireworks and explosives were also native to India, predating discovery in China and
- they were used for both festivities as well as warfare.

Infact, there are more possibilities for it having travelled from India to China and Arabia in the first place.

Thus, so far we have seen not only a connect between fireworks and Deepavali, but also the fact that fireworks and explosives go back before 300 BCE in India.

We will now look for continuity of usage of fireworks in celebrations, in India.

If at any point in history, we come across any sign of using firecrackers to celebrate other occasions in the land of India, then it also implies that Deepavali too would have been celebrated using firecrackers then.

## **HISTORY OF FIREWORKS IN INDIA**

### ***Bogar's Fireworks – 3000 BCE, 5000 Years Ago***

It is worth noting that in literary and history circles, especially in Tamil Nadu, there is mention of how firecrackers can be traced back all the way to the Tamil *Siddhars* and Bogar.



**The Siddha Saint Bogar**

A goldsmith by birth and alchemist by practice, Bogar had put the knowledge of chemistry, botany and physiology to a combined, good use. He is credited with having discovered many medicinal cures as well as many chemical and mechanical applications such as steam boats, flying aircrafts etc.

His work "**Bogar 7000**", as we have seen describes the various works and experiments he had carried out including formulae for some of them.

The Tamil records speak of Bogar having travelled to China and Arabia to spread knowledge.

Others Siddhars too, many before him, have described preparation and usage of *Sarakku Vaippu*, chemical compounds made using Salts such as Saltpetre.

Parikshit, the grandson of Arjuna of Mahabharata times, had called for a conference of all *Siddhars*. Mahabharata, whose events are dated to around 5000 years ago, fixes the times of the line of *Siddhars* also, to 5000 years.

#### ***Kautilya's Arthasastra – 300 BCE, 2300 Years Ago***

We have seen references to explosives and fireworks in Kautilya's Arthasastra, where they were known as *Agniyoga*, *Agnisamyoga*, *YogaAgni*, *YogaAgniDhooma* etc.

The *Sanskrit* dictionary too contains age old, native words such as *Agnichurana*, *Sphotak*, *Visphotak* for explosives and words such as *agnikreeda* meaning sporty display of fires, pointing to ancient Indians' knowhow and usage

### ***Bhoja Fireworks – 1000 CE, 1000 Years Ago***

Around 1000 CE, the vast region of Malwa in Central India was ruled by Raja Bhoja, who was an accomplished scientist, engineer as well as able administrator. The present day city of Bhopal and the 1000 year old dam there, in good working condition even today, owe their name and fame to his technological and administrative skills.



**Raja Bhoja**

**Malwa kingdom**

Bhoja had devised new engineering devices based on mechanics and thermodynamics for protection, defence, comfort as well as for fun.

His work *Samarangana Sutradhara* describes how fire and certain chemicals could be used in a controlled manner to create objects that could lift off into the sky, create a blast, display lights and sound.

Spectators used to gather to watch him set off such displays

### ***Fireworks at Temple Festivals – 1000s CE, 1000 Years Ago***

Pooram is one of the prominent festivals of Kerala and procession of the deity forms an important part of this festival. Fireworks, called *Vedikettu*, at the time of the procession of the deity is the hallmark of the festivities of this temple.

The Pooram as a festival is traced to over 1000 years ago.

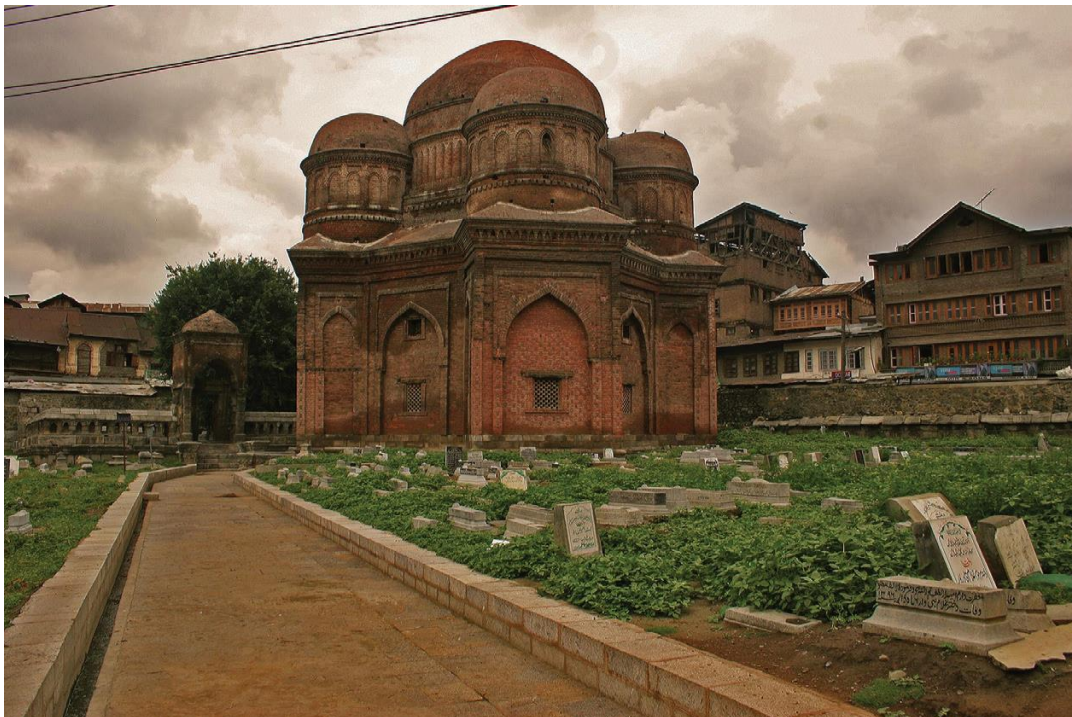
There are many Pooram festivals across Kerala, of which Trissur Pooram is the highlight in recent times since 1700s. Prior to that, Arattapuzha Pooram was the largest Pooram. Many other Poorams continue to be held in many villages of Kerala even today.



Caprisoned Elephants waiting for Fireworks to Begin at Trissur Pooram Festival

***Indian Treatises on Fireworks – 1400s CE, 600 Years Ago***

Zain-ul-Abidin, the Raja of Kashmir between 1421 and 1472 CE, had composed 2 works on the manufacture of fireworks.



The tomb of the Kashmiri king, Raja Zain-ul-Abidin

The *Sanskrit* text *Kautukachintamani* by Gajapati Prataparudradeva of Orissa authored between 1497 and 1539 CE also contains formulae for making different kinds of fireworks.

### ***Vijayanagar Fireworks – 1500 CE, 500 Years Ago***

Vijayanagar was a kingdom that covered the Central Deccan area with its capital at Hampi. Its most famed king was Krishnadevaraya. The Vijayanagar kingdom was famed for its prosperity and well administered society.

History of the Vijayanagar kingdom, which was at its peak around 500 years ago, speaks of dazzling displays of fireworks during festive occasions.



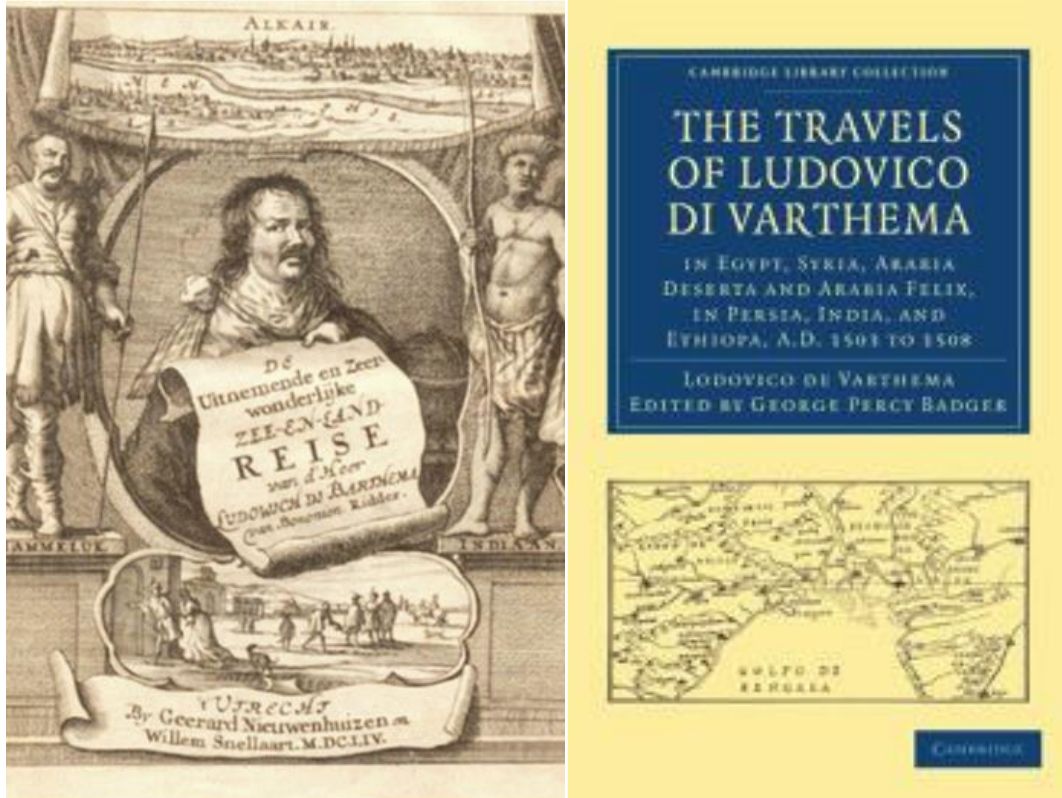
Map of Vijayanagar kingdom



Krishnadevaraya

### **Foreigners Observe Indian Fireworks At Vijayanagar**

1. Barbosa, the Italian traveller who came to Vijayanagar, during the prosperous reign of Krishnadevaraya, writes in his travelogue about how *Deepavali* was celebrated in Hampi with fireworks. This clearly shows us that celebration of *Deepavali* with fireworks has been a tradition of this land for atleast over 500 years.
2. Varthema, another Italian traveller who visited much of S.E.Asia between 1502 and 1508, writes about the people of Vijayanagar as great masters in the art of making fireworks and how their fireworks had reached the islands of Sumatra.



Ludovico di Varthema, 1470–1517 & his book

- Abdar Razzak, an Ambassador from the court of Emperor Shah Rukh of Turkey to the court of the Vijayanagar kingdom, during his visit between April to December 1443, mentions about having seen the use of fireworks in the palace grounds of Vijayanagar, as part of the grand celebrations on the occasion of the Mahanavami festival (i.e. Navaratri / Dassera). It is a celebration which continues even today in the palace grounds of Mysore.

### *TamilNadu – 500 Years Ago*

Use of fireworks for celebrations was also popular down south in Tamil Nadu as can be seen from photos of a mural from the Thiruvavur temple going back by around 500 years. Thiruvavur is a temple town famous for both its Shiva temple as well as for being the birthplace of the 3 forerunners of Carnatic Music – Thyagaraja, Shyama Sastri and Muthuswamy Dikshitar.

Two of them even show an assembly for firing rockets in a series, like the ignite controller used in pyrotechnic displays of today.





Mural in Thyagaraja Swamy temple, Thiruvarur, Photo taken by Dr.S.Venugopalan, Enathur College, Kanchipuram



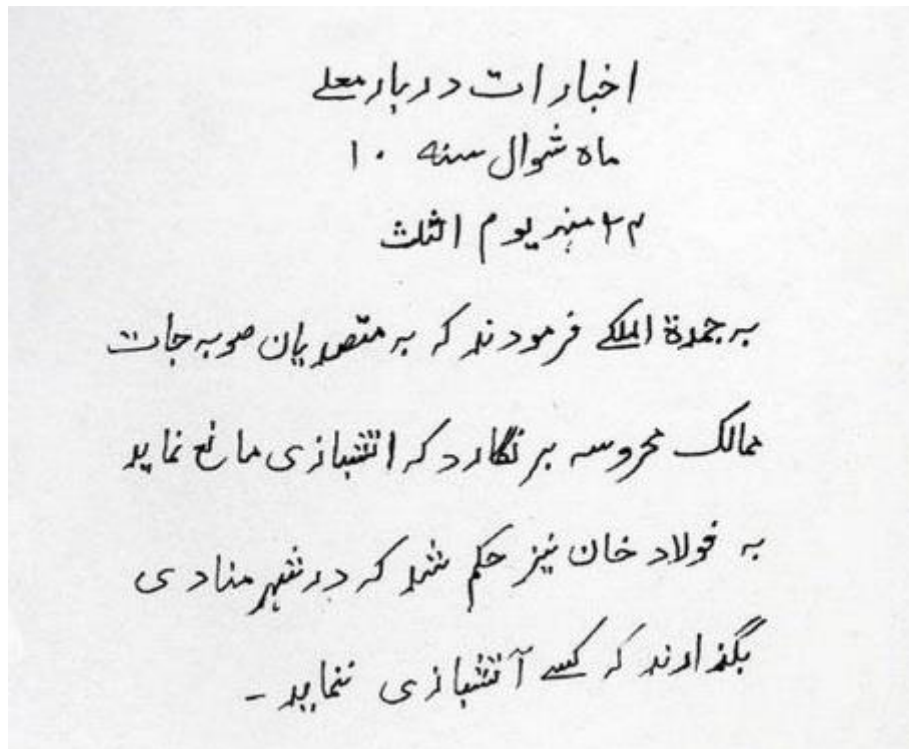
Mural in Thyagaraja Swamy temple, Thiruvarur showing use of Pyrotechnic Igniter Control box

Photo taken by Dr.S.Venugopalan, Enathur College, Kanchipuram



### Fireworks During Mughal Rule in 1600s – 400 years Ago

During the rule of Mughal Emperor Aurangzeb too, fireworks had formed the central idea of celebrations. This can be gathered from a *Firman*, a diktat issued by Aurangzeb in the year 1667 CE.



The record of the Firman in *Akhbarat-i-Darbar-i-Mu'alla*, Julus 10, Shawwal 24 / April 9th 1667. Source – FACT Museum

**April 9<sup>th</sup> 1667.**

**Akhbarat-i-Darbar-i-Mu`alla, Julus 10, Shawwal 24**

***"The Emperor ordered Jumdat-ul-Mulk to write to the Mutsaddis of all the subahs (provinces) of the empire that display of fire-works (atishbazi) is being forbidden. Also, Faulad Khan was ordered to arrange for announcement in the city by the beat of a drum that no one is to indulge in atishbazi."***

**Note:**

***The Hindus celebrate Diwali to commemorate the return of Lord Ram to Ayodhya, after fourteen years of exile and victory over Ravana, by lighting lamps and bursting crackers etc.***

***Some time before imposing the ban on atishbazi (fireworks) Aurangzeb had written (22 November 1665) to the Subahdar of Gujarat that,***

***"In the city and parganas of Ahmedabad (or Gujarat) the Hindus, following their superstitious customs, light lamps in the night on Diwali... It is ordered that in bazars there should be no illumination on Diwali." (Mirat, 276).***

[Translation of Firman shows how Aurangzeb was trying to ban fireworks in India. Source – Exhibit in FACT Museum](#)

This was over 350 years ago. It also shows how Deepavali was also being celebrated with fireworks in Gujarat.

It further shows how Aurangzeb 350 years ago had imposed a ban on fireworks to restrict the celebration of Diwali in India by Hindus.

The popular use of fireworks for festivities across many parts of India can be gathered from many paintings during the Mughal and British period.

**Mughal Period Paintings**



Wedding Procession of Dara Shikoh displaying the display of Fireworks and Bamboo rockets Painted in 1740s,  
Source – National Museum, Delhi



Fireworks used in festivities used during The night of Shab-i-barāt. Govardhan Style Painting, Mughal (Delhi) c.1735-40.  
Source - British Library, Johnson Album 20,2



Rajasthani ladies lighting fireworks during Diwali, painted by an unknown artist in 18th Century CE, housed at Victoria and Albert Museum, London, Museum no. IM.104-1922.



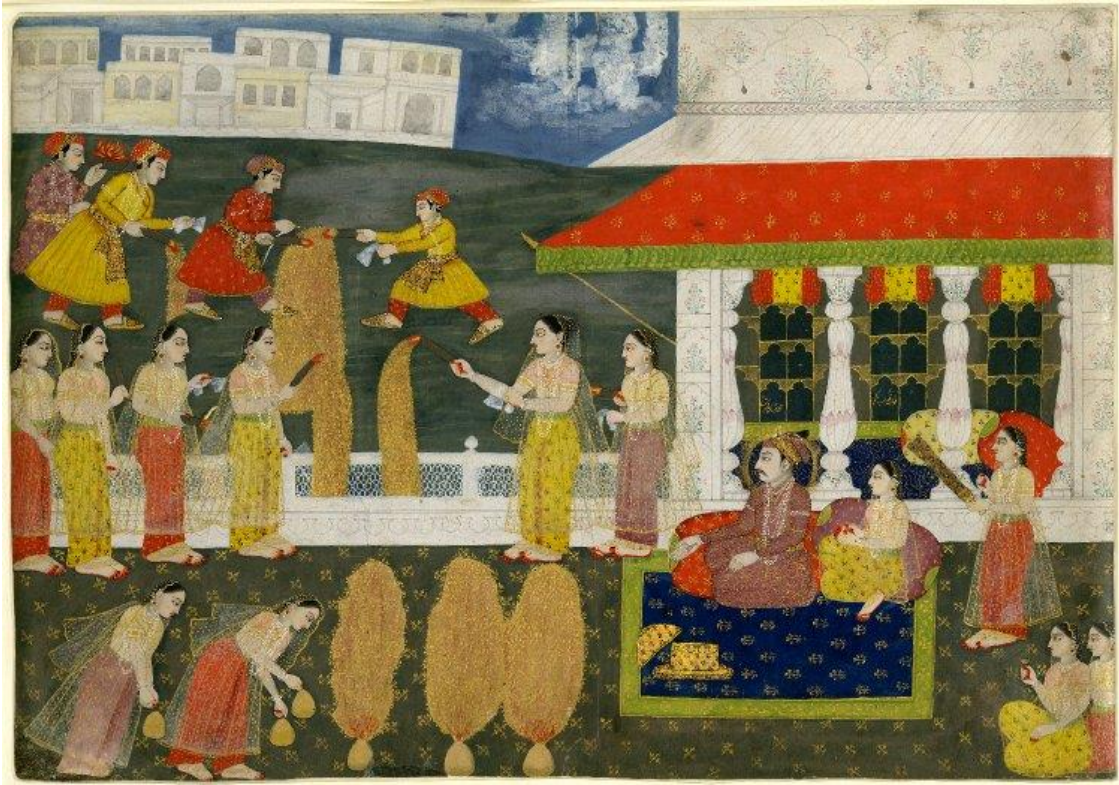
**Court Ladies Playing with Fireworks**

Source – Smithsonian Institutions, Painting by Muhammad Afzal; ca. 1740; F1924.6, Purchased from Freer Gallery of Art



Woman lighting fireworks, dated 18th century CE by an Unknown Painter, Source - Museum of Fine Arts (MFA), Boston, Purchased by the MFA in 1964 from a London private collection. Funded by John Ware Willard Fund





A firework display for Mughal King Muhammad Shah, dated around 1730 CE. Source – British Museum Online Collection, 1920,0917,0.237.

### British Period Paintings



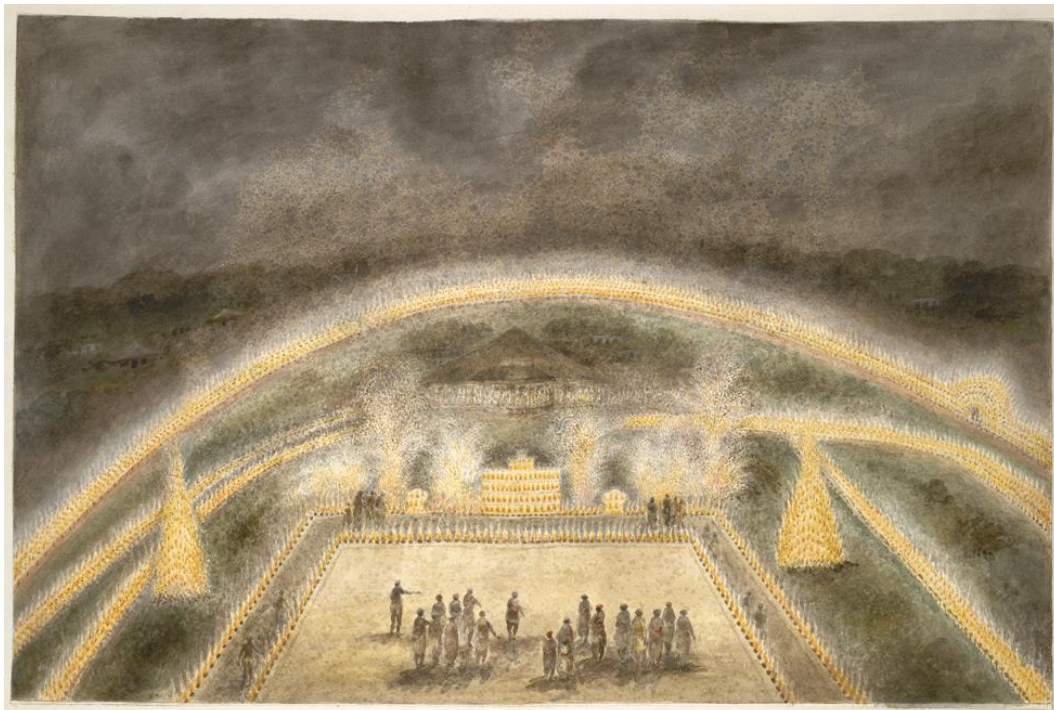
'Display of Fireworks before the Agnah Mahal at Morshedabad.' A Murshidabad style painting by an Anonymous painter, dated to c. 1790-1800. Source – British Library, Online Gallery, Add.Or.3234

Sita Ram, a painter who lived around 1740s was known for his paintings on the scenes of activities and sights in India. He had travelled with Warren Hastings from Calcutta to Delhi between 1814 – 15 to

illustrate Hastings' journey. He had painted these paintings of sights he had encountered enroute. Some of his paintings have captured the beauty of lights and fireworks as a grand panoramic scene, the most famous one being the illumination in Fatehgarh.



**'Illuminations on the 12th. of August at Futtehghur.'** - Illuminations at Fatehgarh from 'Views by Seeta Ram from Agra to Barrackpore Vol. X' by artist Sita Ram between 1814-15. Source – British Library, Online Gallery, Add.Or.4871, Item number: 4871



**"Illumination as seen at another point."** - Illuminations at Fatehgarh from 'Views by Seeta Ram from Agra to Barrackpore Vol. X' by artist Sita Ram between 1814-15. Source – British Library, Online Gallery, Add.Or.4872, Item number: 4872



**Illumination at Constantia - Illuminations at Constantia in Lucknow from 'Views by Seeta Ram from Agra to Barrackpore Vol. iv' by artist Sita Ram between 1814-15.**

Source – British Library, Online Gallery, Add.Or.4752, Item number: 4752



**Farhat Baksh in Lucknow lit by coloured lamps and fireworks – Painting from 'Views by Seeta Ram from Agra to Barrackpore Vol. iv' by artist Sita Ram between 1814-15.**

Source – British Library, Online Gallery, Add.Or.4760, Item number: 4760

The fact that Sita Ram had painted so many fireworks scenes in North India, in the period of 1 year, shows the prolific usage of fireworks for display during 1700s.

### Fireworks in Calcutta, 200 years ago

Bengal was the hub of Saltpetre trade in India. Not only did it trade in the Saltpetre produced locally but it was also the sea trade centre for export of Saltpetre produced all the way from Bihar, to present day UP to even the North West provinces of Punjab.

#### PURIFICATION AND MANUFACTURE OF SALTPETRE.

Ball (*Econ. Geology*) states that more than two-thirds of the saltpetre which is exported from Calcutta is derived from Tirhut, Saran, and Champaran in Behar. The districts of Cawnpore, Ghazipur, Allahabad, and Benares, however, also contribute, and so does the Pánjab to a limited extent. About the year 1868 the manufacture of saltpetre in the Madura district, Madras, was a monopoly in the hands of a European firm who were under contract to supply the Government with a fixed amount annually. Latterly this trade, Ball adds, was found not remunerative, and accordingly was discontinued.

**Bengal (Behar).**—As this province furnishes by far the largest supply of saltpetre, and is accordingly the locality where the industry may be best seen, it may be selected as a type of what is carried on in other parts of India, although to a much less extent than in Behar. The climate best suited for the production of nitre, is where dry weather follows the rains, and thus, by evaporation, allows the salt to effloresce on the surface. So

**MANUFACTURE**  
**685**  
Conf. with  
pp. 405-406.

**Bengal.**  
**686**

28

S. 636

Extract from Pg 433 of "The Dictionary Of The Economic Products Of India" by George Watt, Vol 6, Part II, Sabadilla to Silica, 1893

West Provinces. The total net imports into the Bombay Port Town and Presidency came to 23,876 maunds, and that amount, it will be noted, was drawn almost exclusively from the North-West Provinces and the Panjáb, little or none being derived from Behar, the chief seat of Indian production.

An analysis of the coastwise transactions and trans-frontier trade would not materially disturb the impression conveyed by the facts already exhibited. A large local demand exists all over India which is met by the Indian article. Little or no foreign saltpetre comes into the country. It is chiefly used up in the preparation of the fire-works employed at festivals and ceremonies. Practically no gunpowder, except of the crudest kind, is manufactured by the Natives. There is one factory in the country, however, in which the Government prepares largely its own gunpowder, namely, that at Dum-Dum near Calcutta. The gunpowder used in sport may be said to be entirely imported. There are, however, many refineries for saltpetre in Behar and the North-West Provinces, and one near Calcutta is owned and worked by a European. The value of the outturn of the better known Indian

**Coastwise.**  
**703**

**Gunpowder.**  
**704**

Extract from Pg 447 of "The Dictionary Of The Economic Products Of India" by George Watt, Vol 6, Part II, Sabadilla to Silica, 1893

The above record, by the British shows that no Saltpetre was imported into India – meaning everything was manufactured locally and used substantially in making fireworks. This can be seen from the painting of a Bengali making firecrackers in Calcutta.



A 1790 painting of a man making firecrackers in Calcutta

Source - 'Maker of Fireworks.' Calcutta ca.1794-1804. Watercolor on paper. Made for the Marquis Wellesley the Governor-General of India. in the "Company Style" by Indian artists, who worked for European patrons esp. in the British East India Company or other companies and colonists in the 18th and 19th C. British Library, Add.Or.1115.

## TO SUM UP

We have seen how Fireworks have consistently and continuously been part of festivities all across India from

- Kashmir in the North to
- Kanyakumari in the South to
- Bengal in the East to
- Gujarat in the West.



Along with festivities, words for fireworks / cracker also exist in almost all regional languages of India, such as

- Bengali - *Atasabaji*
- Gujarati - *Fatakada*
- Hindi - *Aatishbaji*
- Marathi - *Fataka*
- Kannada - *Banabirusu*
- Malayalam - *Pattakam*
- Punjabi - *Phairavaraka*
- Tamil - *Patasu*
- Telugu - *Banasanca*
- Samskrt – *Agnisamyoga / Agnikrida / sphotaka*.

All these show that across times, people have made, traded in and burst firecrackers across all geographical regions of the land, for it to have found its way into the vocabularies of each of these regions.

### **SOUND CONNECT, FROM ALL COUNTS**

We find that Deepavali is not just a one day festival but a festive season comprising of many days of celebration coming together, close to one another.

They were not only different days of celebration but also had different reasons for celebration.

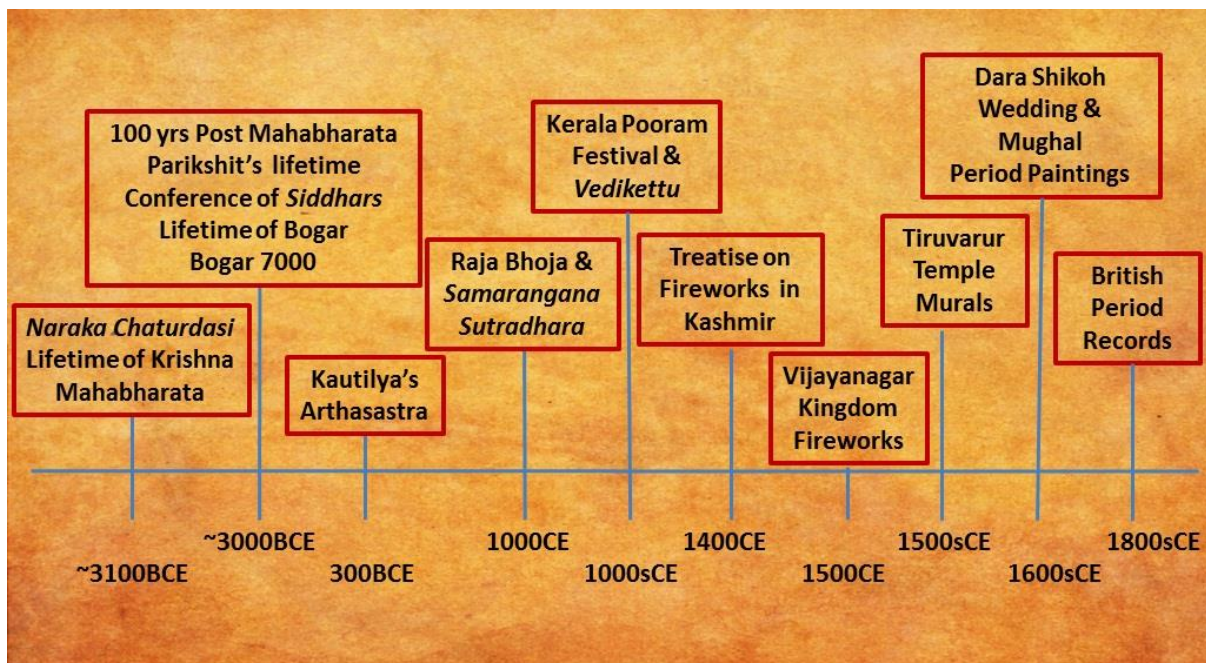
They were not only different reasons for celebration but also had different designated times during the day for celebration.

This was the case all across the land.

But the common connect was Fireworks for celebration during this festive season besides new clothes, sweets and gifts.

From all the above, we can see a “sound” connect between Deepavali and fireworks.

1. Deepavali is traditionally and intrinsically linked to fireworks as an act of cremation of Narakasura and celebration of arrival of good times, from where it took to being used for many other joyous occasions and festivities.
2. Fireworks are not foreign to India. They have had origin in India. Rather there are more pointers for the knowledge to have gone from India to China and Arabia / Persia before 1<sup>st</sup> century CE.
3. The tradition of using fireworks for festivities and celebrating milestone events has also been coming continuously across times and was not introduced in India by the Mughals or Europeans.



## WHY FIREWORKS?

### *Announcements of Arrivals and Departures - Adhir Vettu*

In every major temple festival, when the Deity is brought out in procession, fireworks have been an essential part of processional fanfare. A single loud sounding burst from a firecracker at important milestones of the procession, was a signal to the people of the village and nearby areas to be ready to receive and offer respects to the Deity, who was approaching.

Such fireworks in the Tamil land have been called *Adhir Vettu* – resounding blast.

In Tamil Nadu, there are still specialists who make these loud sounding crackers and they are still used in traditional temple processions and temple festivals, the most famous fireworks being that at Kerala's Poorams.

### ***The Underlying Reason***

More than for merrymaking, bursting of firecracker has been used as way to announce. Announce either arrival or departure - such as the arrival of the Divine or of kings, nobles and leaders, arrival / birth of a child, arrival of a season, arrival of joy etc. An age old practice has also been, to burst cracker on the death of someone too.

In the case of the death of tormentors, it takes on a dual meaning of announcing departure of bad times and arrival of joy.

We have seen this when effigies of Ravana and *Narakasura* made with fire crackers are set aflame on *Vijaya Dasami* day during *Dassehra* and *Naraka Chaturti/Deepavali* respectively, to mark the cessation of sufferings and arrival of good times ahead. A common tradition followed even today, is to burst atleast one cracker, even in the poorest of poor houses, on *Naraka Chaturdasi* to acclaim the death of the *Asura, Naraka*.

With the blurring of the history behind traditions over time, since the death of the wicked also means joy, bursting of firecrackers took on the connotation of celebrations and joy.

### ***An Act of Proclamation***

Bursting of loud crackers besides being a wonderful sight and an expression of merriness has an effect of infusing a sense of bravery, boldness, courage and achievement. It ushers in a feeling of having won over something. It is like an act of proclamation - a proclamation of siding with the right and righteous.

The firecrackers therefore had been put to a fitting use, to evoke such emotions when celebrating memorable occasions.

In England, Guy Fawkes day has been traditionally celebrated with fireworks.



**Guy Fawkes celebration**



America celebrates Independence Day on 4th of July every year with characteristic displays of fireworks.



America's Independence Day Fireworks

### *Discriminate Use*

However, **they can emphasize the cause of celebrations, if only we care to know the cause and care to use the crackers discriminately.**

### **A THRIVING INDUSTRY TODAY**

Making of fireworks is a thriving industry around Sivakasi in Tamil Nadu. Manufacture and export of fireworks and the field of pyrotechnics have become an important contributor to the economy of the land.

During Deepavali week, the pollution level that people complain about, due to bursting of fireworks, reaches 2.5 ppm and is indeed 4 times higher than the pre Deepavali week. But studies also bring forth that within a day or two, the ppm levels return back to normal levels, meaning that the damage is not permanent.

In contrast, the other pollutants released into air, yearlong, are more harmful and do not show any signs of decline.

The pollution that fire crackers give forth is negligible compared to various other sound and air pollutants that we are polluting this earth with, on a daily basis. Infact, in days bygone, the chemicals used in the making of the fireworks were such that smoke released by the burning of firecrackers was also used as a means to disinfect the air around.

So, with regulations on

- safety and labour norms in the manufacture of firecrackers
- transport and storage norms in the trade of firecrackers,
- hazard and disturbance norms in the bursting of firecrackers

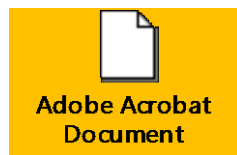
as well as innovations to

- add non-polluting, disinfecting, insect repelling and other beneficial properties in the usage of fireworks and
- make fireworks safe for human and animal lives as well as environment,

we can make every *Deepavali* season **“A SOUND FESTIVAL OF LIGHTS.”**



**Happy Deepavali !!**



eBook - “Deepavali – A Sound Festival of Lights”

When History meets Tradition and  
Tradition meets Science and  
Science meets Nature  
We can advance as balanced and mature peoples