Rainmaking

With the Help of Yajña

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Amazon Books, USA
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Fifth Edition
Kali era: 5119 (c. 2017)
Kalpa era : 1,97,29,49,119
Brahma era: 15,55,21,97,29,49,119

Price: Rs. 200.00

ISBN 81- 87710-37-3

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A Historical Perspective

Rainmaking is not an idea of recent origin that has downed upon the scholars of the twentieth century only. Since long people have been attempting to induce rain by a variety of methods such as the rain dance, singing of rain songs, offering prayers, the sacrifice of men or animals lighting of fires, firing of canon and the production of electric discharges by kites. But none of these methods could stand the test of time and proved to be worthless exercises and so by and by receded to the background and went out of vogue. All of those methods were based on the false belief and assumptions of the people and had no concrete or scientific basis behind them.

Modern Method of Rainmaking

The methods of modern rainmaking are, however, said to be based on a knowledge of physical processes of rain formation. Modern rainmaking experiments are based on three main assumptions,

1. That either the presence of ice crystals in a supercooled cloud is necessary to release snow and rain by the Wagener-Bergeron process, or the presence of comparatively large water droplets is necessary to initiate the coalescence process.

2. That some clouds precipitate inefficiently or not all, because these agents are naturally deficient.

3. That deficiency can be remedied by seeding clouds artificially with either solid carbon dioxide (dry ice) or silver iodide to produce ice crystals, or by introducing water droplets or large hygroscopic nuclei.[1]

Actually, the history of modern rainmaking marked its first beginning in 1931 when Varaat of Holland dropped dry ice,

among other things, into super-cooled clouds and produced slight amounts of rain. The possibility of producing rain from supercooled clouds by the introduction of artificial nuclei was also foreseen by the German cloud physicist Findeisen in 1938, but it was not until 1946 when a satisfactory method of supplying nuclei in the required quantity was discovered. The first time, Vincent J. Schaefer, an American meteorologist and science consultant succeeded in putting 6 pounds of crushed dry ice into a supercooled altocumulus cloud near Greylock Mt. in western Massachusetts on Nov. 13, 1946. In 1947, Vennegut discovered the effectiveness of silver-iodide as a cloud seeding material. This was followed the next year by langmuir's demonstrations that plain water could sometimes trigger the precipitation process in warm clouds by developing a sort of chain reaction in droplet growth. Since then many efforts have been made by meteorologists to find a cloud-seeding material better than silver iodide or dry ice, they are still only materials currently in use for large-scale operations directed towards modifying supercooled clouds.

Though, during this long span of time, a change in techniques of introducing freezing nuclei into clouds has been observed. First of all, freezing nuclei like dry ice or silver-iodide were delivered only by airplane into the clouds. Later a search for better freezing nuclei than dry ice or silver-iodide led to the disclosure that smoke of silver-iodide also acts as still a better freezing nuclei at temperatures as high as -6^0C. Then it was considered not to be necessary to apply an expensive technique of delivering silver iodide by airplane as usual, but it could be introduced in the form of smoke from the ground itself with the help of ground generators or surface burners. This idea was conceived from the Indian tradition of performing *Yajñas.* Actually, these ground generators are the modern representatives of the ancient *Yajña kuṇḍas* or fire altars.

The technique of seeding clouds with the help of surface-burners is very cheap compare to that of an airplane or firing artillery shells, a very old idea revived by Russian scientists.

The technique of *Yajña-kuṇḍas* or surface burners has only one drawback that is to rely on the air currents to carry the smoke up into the atmosphere. In this method, with no control over the subsequent transport of the smoke, it is not possible to make a reliable estimate of the smoke reaching into upper spheres. To overcome this problem, the smoke can be dispersed from burners in aircraft. This idea was also being practised in ancient India, as has been revealed in the *Bṛhadvimānaśāstra,* an ancient Indian treatise on the science of aeronautics. Airplanes were equipped with the *Dhūmodgama* or *Dhūmaprasāraṇa* instruments to disperse the smoke in the atmosphere so that the ill-designed bids of enemy might be foiled, e.g. one verse of the *Bṛhadvimānaśāstra* (15.65) reveals how the airplane was used to be protected from enemies' attack by dispersing poisonous smoke from the *Apasmāradhūmaprasāraṇa Yantra* fitted in the plane.

svayāna rakṣaṇārthāya parayānair yathāvidhi
apasmāra dhūmaprasāraṇa yantraṁ pracakṣate.

In spite of the best thorough-going efforts of meteorologists in the field of rainmaking, it can be concluded that the modern science and technology of rainmaking is still in its infancy. It is confined only up to cloud modification. It has not so far been able to go beyond this. It doesn't see any prospects or scope for cloud-formation. Moreover, the results of trials carried out in the direction of cloud seeding have not been so encouraging and impressive. To sum up, it can be said that modern scientists have just made a beginning in the direction of weather modification and still they are to go a long way up to give a concrete and scientific shape to their immature start. Perhaps, that is why, they have not been able even to speculate to modify the direction of winds, to form clouds, to bring seasonal changes and to ward off the falling rain. Thus even after a long consistent effort of study and research into the field of weather modification, the achievements of the modern science of weather modification may be calculated as nil.

Rainmaking by Vedic Scholars

In addition to the various efforts made in the direction of rainmaking as laid down above, one more attempt has been made since the time immemorial and that is with the help of *Yajña.* This technique has a long standing history and has reached us through and age-old long tradition. That tradition is still alive in the historical records of our *Saṁhitās, Brāhmaṇas. Āraṇyakas, Upaniṣads, Sūtras,* Epics and *Pūraṇas* and other medieval and modern literature pertaining to the *Vedas, Upavedas* or *Vedāṅgas.* First of all, in the history of humankind, the idea of inducing rain with the help of *Yajña* was conceived by a Vedic seer, who in the very explicit terms proclaimed as *vṛṣṭiśca me yajñena kalpatām.*[2] 'Get me rains with the help of *Yajña.*' Perhaps, keeping in view the authenticity of this technique, another Ṛṣi proclaimed '*nikāme nikāme naḥ parjanyo varṣatu'.*[3] 'Let the cloud precipitate as and when we desire.' This science of rainmaking didn't end with these proclamations of the Vedic Ṛṣis, but in course, rainmaking agents were also discovered and it was made known that *Mitra* and *Varuṇa* were the rainmaking agents.

mitrāvaruṇau tvā vṛṣṭyāvatām.[4]

'May the *Mitra* and *Varuṇa* bring rain for you.'

'mitrāvaruṇau vṛṣṭyādhipati tau māvatām.[5]

'May the rainmaking agents, *Mitra* and *Varuṇa,* protect you.'

The other Ṛṣis made further advances in the area and could come to the conclusion that the co-ordination of both the elements is necessary for inducing rain and the proposed coordination could easily be effected with the help of *Yajña.*

yajñā no mitrā varuṇā yajñā devam ṛtaṁ bṛhat.[6]

'*Mitra* and *Varuṇa,'* the main agents of rain, should be coordinated with the help of *Yajña* for the precipitation of rain

Thus the *Yajña* became the part and parcel, in fact the basis of the Vedic life. Perhaps, that is why, the Vedic Ṛṣi didn't

hesitate in passing the direction to every human being to perform *Yajña* season-wise daily, monthly and yearly to stimulate seasonal deities so that they may yield their favour for them as per their desires.

ṛtūn yajña ṛtupatinārtvānut hāyanān
samāḥ saṁvatsarān māsān bhūtasya pataye yajña.[7]

Following the notion of the Vedic Ṛṣi, the author of the *Brāhmaṇas* proclaimed *Yajña* as most noble act.

yajño vai śreṣṭhatamaṁ karma.[8]

They also elucidated the process and role of *Yajña* in stimulating precipitation as :

agnervaidhūmo jāyate. dhūmād abhram. abhrād vṛṣṭiḥ.[9]

'*Yajñīya* fire helps in smoke development, the smoke helps in cloud formation and clouds yield rain.'

The idea of rainmaking with the help of *Yajña,* which found its genesis in the *Saṁhitās* was developed in the *Brāhmaṇas* and *Āraṇykyas* and sought its culmination further in the *Upaniṣadika* literature. The *Upaniṣadika* Ṛṣi at one place doesn't want to miss the opportunity of disclosing the technique as to how to induce an existing cloud to rain. He speaks thus :

parjanyo vāgnir gotam tasya saṁvatsara eva samidabhrāṇi dhūmo vidyudarcciraśanir aṅgārā hrādunayo visphuliṅgās-tasminnetasminn agnau devāḥ somaṁ rājānaṁ juhvati tasya āhutyai vṛṣṭi samabhavati.[10]

'That is to say briefly, an existing cloud may be stimulated to precipitate by the *Soma āhuti* released into the *Yajña.*'

The same idea was further inherited by the Epics and *Purāṇas.* Lord Krisna in his massage to the dejected and disappointed Arjuna while relating the overall dominance of *Yajña,* describes the fact that the *Yajña* is helpful in inducing rain. The verses go like this :

annād bhavanti bhūtāni
parjanyād anna saṁbhavaḥ.

yajñād bhavati parjanyo
yajñaḥ karma samudbhavaḥ.[11]
karma brahmodbhavaṁ viddhi,
brahmākṣara samudbhavam
tasmāt sarvagataṁ brahma nityam
yajñepratiṣṭhitam.[12]

In addition to this, the *Bṛhadvimānaśāstra* an ancient treatise on the science of aeronautics, treats this subject in a more technical and mechanised way. It gives detailed break-up as to how to develop various types of scientific instruments to save the airplane from all those natural calamities which are likely to cause damage to it and its crew. For instance, it proposes on the basis of *Yantrasarvasva* to develop a *Śiraḥkilaka* instrument to dispel the effect of lightning.

yadapāyo vimānasya bhavedaśanipātataḥ
tadapāya nivṛttya-rthaṁ śiraḥkilaka yantrakam.[13]

Further, it lays down the techniques as to how to develop, among several other instruments, the *Varṣopasaṁhāra, Tryāsyavātanirsana* and *Ātapopasaṁhāra* instruments to neutralise the effects of rain, winds and heat respectively, which are likely to affect the aeroplane. e. g.

uktāni hi yantrasarvasve yantratrayaṁ yathā vidhi.[14]
sarveṣāṁ sukhabodhāya tānyevatra pracakṣate

tryāsyavāta nirasana yantraṁ tadvān manoharam.[15]

sūryātaposaṁhāra yantraṁ caiva tataḥparam
ativarṣopasaṁhāra yantraṁ ceti tridhā smṛtam.[16]

To protect the airplane from the opposition of strong air, *Vimānastambhan* instrument was stated to have been installed in the airplane, e. g.

vātapravāhasaṁasarga parihārāya kevalam

vimānastambhanayantraṁ yathāmati nirupyate.[17]

Swami Dayananda's Revelation

In the modern times, the age old idea of rainmaking which

fizzled out with the passage of time was revived by Swami Dayananda Saraswati, a great embodiment of Vedic life and thought. He made revolutionary observations on the various burning issues concerning political, social, economic, religious, and linguistic aspects of life and on the interpretation of ancient Indian language and literature. Among an immense number of things, he observed on the basis of the evidence from the Vedas that the rain could be induced with the help of *Yajña* as and when we desire. During the course of relating various purposes of *Yajña,* he gives a detailed description of the process of inducing rain with the help of *Yajña.* He bases his ideas on the evidence of *Śatapatha Brāhmaṇa* 5.3.5.17. According to him,

> *agneḥ sakāśād dhūmavāṣpau jāyete. yadā yamagnirvṛkṣauṣ adhivanaspati jalādipadārthān praviśya tān saṁhatān vibhidya tebhyo rasaṁ ca pṛthak karoti, punaṣte laghutvamāpannā vāyvādhār-eṇoparyyā kāśaṁ gacchanti.tatra yāvān jalarasā-ṁśastāvato vāṣpasaṁjñāsti. Yaśca niḥsneho bhāgaḥ sa pṛthivyaṁśo'sti. ata evobhaya bhāgayukto dhūma ityupacaryate. Punar dhūmagaman-ānantaramākāśe jalasaṁcayo bhavati. tasmādabharaṁ ghanā jāyante. tebhyo vāyudalebhyo vṛṣṭirjāyte.*[18]
>
> 'That is, due to the treatment with fire, carbon and vapour are generated. When the fire enters the trees, herbs, plants and water, etc. it decomposes them and separates their juicy substance from them, which on account of its lightness, is accelerated upward towards the sky in conjunction with air. In this process, the juicy substance which is an aqueous form is known as vapour and what remains dry is known as carbon which is the part of earth. So both forms earthen and aqueous in combined state are known as smoke. After the smoke reaches the sky, water vapours accumulate there. These vapours give birth to clouds and clouds yield rain.'

Rainmaking by Ram Narain Arya

Following Dayananda's revolutionary observations, the idea of rainmaking with the help of *Yajña* gained a momentum and found a new support at the hands of *Āryasamājī* scholars.

A few of them even came forward who endeavoured to induce rain or to prevent it, but their experiments couldn't yield fruitful results.[19] Here in this regard, a particular mention may be made of Ram Narain Arya, M.A. who can be called as a perfect rainmaker of the twentieth century. After spending 35 long years of study, research and experimentation, he has come to a startling conclusion what he calls the Vedic way to beat the nature. Not only has he been able to induce rain successfully, he has been forming clouds, changing the flow of air in terms of direction and speed, stopping the falling rain and even modifying into the weather conditions, from dry to wet, hot to cold and vice-versa for the last 36 years. The author of the present lines has been a close associate and witness to most of the rainmaker's experiments carried out by him from time to time at various places in India. Having been confirmed strongly of the authenticity and success of the rainmaker's experiments, this author thought it viable to bring the rainmaker's research into the lime light so that not only the people of India but the people of the whole world may be benefitted by the experiences and research of the rainmaker. Actually, the rainmaker has preserved his ideas and experiences, with regard to his experiments on weather modification like rainmaking, prevention of rain, modification into the direction and speed of airflow, modification into the other weather conditions, prevention of pollution and diseases in his daily diaries written by him from time to time. This author could get the privilege to make good use of the subject matter enshrined in the daily diaries (DD) of the rainmaker. At the places of apprehension and doubts, he made serious discussions with the rainmaker to clarify the same. To proceed further, it is necessary to render hereunder the brief life-sketch and work of the rainmaker.

A Brief Life-sketch of the Rainmaker

Sh. Ram Narain Arya born on *Amāvaśyā* (the new moon day) of the *Srāvaṇa* month in 1993 of the *Vikram* era in the village of Farmana, District Sonepat, Haryana. His mother breathed her last when he was in his infancy. Under the

circumstances, he along with his two brothers and one sister was brought up by his father. His father, Sh. Ratti Ram Arya was fond of physical exercises and wrestling. A devout and religious fellow, he was a devotee of the Veda. Ram Narain was greatly influenced by his father and inherited his qualities of doing *Yaga* and physical exercises regularly. He completed his schooling from the village high school. Afterwards, he passed out the examination of I.G.D. Bombay from Baraeli and was appointed in 1955 as a Drawing teacher in the Govt. Higher Secondary School, Bahujholari (District Jhajjar of Haryana). Late in the forties, he completed his B.A. and did his M.A. in Political Science and Sanskrit (Veda). From the childhood, he was very intelligent, curious and studious one. He had the chance to study the literature of Kabeer, Raheem, Tulsidas, Raidas and Guru Nanak. His wife, Prem Vati Prabhakar, who is also a religious lady, used to read him the stories of *Rāmāyaṇa*, *Mahābhārata* and *Gitā*. All this added to his detachment from the worldly allurements. *Gṛhastha* as he is, he is leading a life of an ascetic. In 1955, he came in contact with Bhagvandeva Acharya (Swami Omananda), Acharya Baladeva and Brahmachari Indradeva (Swami Indravesh) at Gurukul Jhajjar. This new acquaintance promulgated him to study *Vedas.* He then moved to the study of the *Vedas, Upavedas* and *Vedāṅgas.* Influenced by Swami Dayananda's works such as *Satyārhta Prakāsh* and *Saṁskāravidhi,* he started performing *Yajñas* daily at the time of sun set and sun rise. During his studies of the *Vedas* and Dayananda's works, he came across such references as could give him an idea of rainmaking with the help of *Yajña.* He also made an in-depth study of the works of Āryabhaṭṭa, Varāmihira and Bhāskarācārya which added to his knowledge of geology and astronomy. He had a chance to make an intensive study of the *Bṛhadvimānaśāstra,* an ancient Indian treatise on the science of aeronautics composed by Maharishi Bharadvāja. This work closeted him with the different aspects of ancient Indian science related with the weather modification. Thus having taken cues of rainmaking with the help of *Yajña* from the Vedas, Upavedas, Vedāṅgas and Dayananda's works

and having acquired the knowledge of the properties of the matter as described therein, he all set to perform *Yajñas* in a particular direction. It was to modify weather, modify airflow in terms of direction and speed, to induce rain and to prevent the same, to remove famines, to prevent deluges, diseases and to beat the pollution.

The experimental *Yajñas* performed strictly in conformity or in tune with the Vedic principles and surprisingly enough everything was witnessed taking place actually which was considered sometimes ago a fallacy or mythology. He calls this method of controlling natural powers with the help of *Yajña* as a *Vedic way to beat the nature.* Not only did he do experiments with the nature outside, but he also practised *Yoga* to attain self-accomplishment and applied it to detect the deficiencies or inconsistencies in the matter of natural course. According to him, *Yajña* and *Yoga* should go side by side. By way of *Yoga,* one can feel the nerve of nature and detect its deficiencies or inconsistencies like an able and dexterous physician does with a patient and by way of *Yajña,* medication of nature can be done to remedy all its deficiencies and inconsistencies. His dedication to this cause was so great that all the institutes he served were converted by him into laboratories for his experiments on nature. He served at the following institutions. G.H.S.S. Bahujholari (1955-66); G.M.S. Ruraki (1967-68); G.M.S. Guhna (1-4-1968 to 24-9-1968); G.H.S. Khanpur Kalan (25-9-68 to 7-10-68); G.H.S. Mundalana (11-10-1968 to 18-7-1973); G.M.S. Rithal (19-7-1973 to 31-7-1974); G.G.H.S. Bhainswal Kalan (1-8-1974 to 18-5-1976); G.M.S. Katwal (19-5-1976 to 1-8-1978); G.H.S. Bhainswal Kalan (2-8-1978 to 4-7-1979); G.M.S. Jasrana (5-7-1979 to 7-9-1989); G.H.S. Anwali (8-8-89 to 8-12-90); G.H.S. Bichpari (9-12-90 to 21-7-91). All these schools have been the main centre of his experiments.

Having been confirmed of the validity and authenticity of the Vedic principles, he became a staunch exponent of the Vedic life and thought. He made it his life mission to propagate Vedic teachings and thought among the general

masses, particular youths and for that matter, he used to deliver prayer time discourses before students on the Vedas and their ancillary sciences during his teaching days. He, thus, made them known about the glorious past of India and ancient Indian advancement in the field of philosophy, sociology, polity, theology, science and technology. He voluntarily retired from the Govt. service in 1991 in order to speed up his activities for the furtherance of this noble cause. After retirement, he speeded up his mission of spreading scientific knowledge of the Vedas. He toured extensively and delivered more than 1000 public and popular lectures in different educational institutions and Jails to enlighten the students and jailed persons of the rich scientific heritage of ancient India and exhorted them to go for *Yoga* and *Yajña* for better health and healthy environment in society. He warns the younger generation not to fall a prey to the cultural pollution that is posing a great danger to the humanity at large. He himself leads a very simple and austere life. His whole life has been a life of relinquishment and penance. Through *Yoga* and penances he has so regulated his life that he spends the chilly winters away in simple summer wears. He takes simple *sātvika* meals often saltless, chilly-less and sugarless. According to him, prior to the regulation of nature, regulation of the self is a must.

Rainmaking with the help of '*Yajña*'

As already indicated above, the modern meteorologists are seeking the possibility of producing rain from super-cooled clouds by introducing some freezing nuclei therein. In their concerted efforts, they have been able to discover solid carbon dioxide (dry ice) and silver iodide as successive better cloud seeding materials. Their further efforts could not reveal any improvement, rather could bring a change in techniques of introducing freezing nuclei in clouds. First of all, freezing nuclei like dry ice or silver iodide were delivered only by airplane into the clouds. Later a search for better freezing nuclei than dry ice or silver iodide led to the disclosure that the

smoke of silver-iodide also act as still a better freezing nuclei at temperatures as high as 600 C. Then it was considered not to be necessary to apply expensive technique of delivering silver iodide by airplane as usual, but it could be introduced in the form of smoke from the ground itself with the help of ground generators or surface burners.[1] This idea was conceived from the Indian tradition of performing *Yajña*s. Actually, these ground generators are the modern representatives of the ancient *Yajña* Kuṇḍas or Fire-alters. The technique of seeding clouds with the help of surface burners is very cheap compared to that of airplane or firing artillery shells, a very old idea revived by Russian Scientists, the technique of *Yajña*-Kuṇḍas or surface burners has only one drawback that is to rely on the air currents to carry the smoke up into the atmosphere. In this method, with no control over the subsequent transport of the smoke, it is not possible to make a reliable estimate of the smoke reaching into upper spheres. To overcome this problem the smoke was dispersed from surface burners in aircraft. This idea was also practised in ancient India, as has been revealed in the Bṛhadvimānaśāstra, an ancient Indian treatise on the science of aeronautics. Airplanes were equipped with the Dhūmodgama or Dhūmaprasāraṇa instruments to disperse the smoke in the atmosphere.

In spite of the best thoroughgoing efforts of meteorologists in the field of rainmaking, it can be concluded that the modern science and technology of rainmaking is still in its infancy. It is confined only up to cloud modification it has not so far been able to go beyond this. It doesn't see any prospects or scope for cloud formation. Moreover, the results of trials carried out in the direction of cloud seeding have not been so encouraging and impressive. To sum up, it can be said that modern scientists have just made a beginning in the direction of weather modification and still they are to go a long way up to give a concrete and scientific shape to their immature start. Perhaps, this is why, they have not been able even to speculate to modify the direction of winds, to form clouds, to bring seasonal changes and to ward off the falling rain. Thus, even after a long consistent effort of study and research into the

field of weather modification, the achievements of the modern science of weather modification may be calculated as nil.

In addition to the various efforts made in the direction of rainmaking as laid down above, one more attempt has been made since the time immemorial and that is with the help of *Yajña* (Here it may be noted that there are many types of *Yajña*s such as *Śrauta Yajña*s, *Gṛhya Yajña*s and *Pañca-mahā Yajña*s like *PitṛYajñas*, *BrahmaYajña*, *Bali-vaiśvadevaYajña*, *Atithi-Yajña* and *Deva-Yajña*. In the present context, *Yajña* means *DevaYajña*). This technique has a long standing history and has reached us through an age-old long tradition. That tradition is still alive in the historical records of our Saṁhitās, Brāhmaṇas, Āraṇyakas, Upaniṣads, Sūtras, Epics and Purāṇas and other mediaeval and modern literature pertaining to the

Vedas, Upavedas or Vedāṅgas. First of all, in the history of humankind, the idea of inducing rain with the help of *Yajña* was conceived by a Vedic seer, who in the very explicit terms proclaimed as *vṛṣṭiśca me yajñena kalpatāṁ*[2], 'That is get me rains with the help of *Yajña*.' Perhaps, keeping in view, the authenticity of this technique, another Ṛṣi proclaimed *nikāme nikāme naḥ parjanyo varṣatu*[3]. 'Let the cloud precipitate as and when we desire.' This science of rainmaking didn't end with these proclamations of the Vedic Ṛṣis, but in course, rainmaking agents were also discovered and it was made known that Mitra and Varuṇa were the rainmaking agents.

Mitrāvaruṇau tvā vṛṣṭyāvatāṁ[4].

'May the Mitra and Varuṇa bring rain for you.

Mitrāvaruṇau vṛṣṭyādhipati tau māvatāṁ[5].

'May the rainmaking agents, Mitra and Varuṇa, protect you.

The other Ṛṣis made further advances in the area and could come to the conclusion that the co-ordination of both the elements is necessary for inducing rain and the proposed coordination could easily be effected with the help of *Yajña*.

yajñā no mitrāvaruṇā yajñā devaṁ ṛtaṁ bṛhat.

'Mitra and Varuṇa, the main agents of rain should be co-

ordinated with the help of *Yajña* for the precipitation of rain.'

Thus the *Yajña* became the part and parcel, in fact, the basis of the Vedic life. Perhaps, this is why, the Vedic Ṛṣi didn't hesitate in passing the direction to every human being to perform *Yajña* season-wise, daily, monthly and yearly to stimulate seasonal deities so that they may yield their favour on them as per their desires.

Ṛtun Yajña ṛtupatinārtvānut havyānāṁ samāḥ saṁvatsarān māsān bhūtasya pataye Yajña.

Following the notion of the Vedic Ṛsi, the Brāhmaṇkāras proclaimed *Yajña* as the noblest act.

Yajno vai ṣreṣṭhatamam karma.[8]

They also elucidated the process and role of *Yajña* in stimulating precipitation as:

agnervai dhūmo jāyate. dhumād abhram. abhrād vṛṣṭiḥ.

'*Yajnīya* fire helps in smoke development, the smoke helps in cloud formation and clouds yield rain.'

The idea of rainmaking with the help of *Yajña*, which found its genesis in the Saṁhitas developed further in the Brāhmaṇas and Āraṇyakas and sought its culmination in the Upaniṣadic literature. The Upaniṣadic Ṛṣi at one place doesn't want to miss the opportunity of disclosing the technique as to how to induce an existing cloud to rain. He speaks thus:

Parjanyo vāgnirgotam tasya saṁvatsara eva samidābhraṇi dhumo vidyud arccirasanir aṅgārā hrādunayo visfulingās tasminn etasminn agnau devāḥ somaṁ rājānaṁ juhvati tasya āhutyai vṛṣṭi saṁbhavati.[10]

'That is to say, O' Gotam! *Parjanya* (the cloud) is the second sacrificial altar. It has year as its *samidhā* (sacrificial fuel), *abhra* (supercooled cloud) as its smoke, lightning as its flame, *aśani* as its ember and the thunder-sound as its spark. This cloud can be induced to rain by way of augmenting the *somīya* element in the atmosphere with the help of *somīya āhutis.'*

The same idea was further inherited by the Epics and Purāṇas. Shri Krishna in his message to the dejected and disappointed Arjuna, while relating the overall dominance of Yajña, describes Yajña as helpful in inducing rain. The verses go like this :

annādabhavanti bhūtāni
parjanyādannasaṁbhavaḥ.

yajñād bhavati parjanyo
Yajñaḥ karmasamudbhavaḥ.[11]

karma brahmodbhavaṁ viddhi,
brahma kṣarasamudbhavam

tasmāt sarvagataṁ brahmanityam
yajñepratiṣṭhitam.[12]

In the addition to this, the Bṛhadvimānaśāstra an ancient treatise on the science of aeronautics, treats this subject in a more technical and mechanised way. It gives detailed break-up as to how to develop various types of scientific instruments to save the airplane from all those natural calamities which are likely to cause damage to it and its crew. For instance, it proposes on the basis of Yantrasarvasva to develop a Siraḥkilaka instrument to dispel the effect of lighting.

yadapāyo vimānasya bhavedasanipātataḥ
tadapāya nivṛttya-rtham Siraḥkilaka Yantrakam.[13]

Further, it lays down the techniques as to how to develop, among several other instruments, the Varṣopasaṁhāra, Tryāsyavātanirsana and Ātaposaṁhāra instruments to neutralise the effects of rain, winds and heat respectively, which are likely to effect the airplane, e.g.

uktāni hi yantrasarvasve
yantratrayaṁ yathāvidhi.[14]

sarveṣām sukhabodhāya tānyevātra pracakṣate
tryāsyavātanirasanayantram

tadvān manoharam.[15]
sūryātaposaṁhārayantraṁ caiva tataḥparam

ativarṣopasaṁhārayantraṁ ceti tridhā smṛtam.[16]

To protect the airplane from the opposition of strong air, Vimānastambhana instrument was installed in the airplane, e.g.

vātapravahasaṁsarga parihāraya kevalam.
vimānastaṁbhanayantra yathāmati nirupyate [17]

Method of Rainmaking with the help of 'Yajña'

In fact, the rainmaking with the help of *Yajña* as stated earlier is a systematic process of co-ordinating the rainmaking agents, the Mitra and Varuṇa. For instance the VS. Says:

Yajñā no mitrāvaruṇā yajñā devaṁ ṛtaṁ bṛhat.19

Mitra is a soma element or āpastattva, or say negative charge in modern scientific terms, Varuṇa is an āgneya element or jyotiṣtattva, i.e. a positive charge. Co-ordination of both the elements in a particular ratio stimulates rain. Apāṁ ca jyotiṣaśca miṣri bhāvakarmaṇo varṣakarma jāyate.20 The deficiency of any of these elements in the atmosphere may be covered up with the help of their respective āhutis offered in the terrestrial fire or Yajñīya fire. Actually, *Yajña* acts as the remote controller and coordinator for the various deities, i.e. the natural elements existing in the mid-sphere or celestial sphere. Rainmaking with the help of *Yajña* is a function of maitrāvaruṇi āhutis offered to the fire in a particular ratio subject to the position of the two elements in the atmosphere. So, a rainmaker has a tough task before him. He will have to be very vigilant and constantly keep himself in touch with the weather conditions prevailing in the atmosphere. For rainmaking, he doesn't have to be dependant, as the other meteorologists have to be, on the pre-existence of the clouds. In fact, he is to start from zero and modify weather, as the need be, to any such an extent as to blow moisture-bearing winds, to generate evaporation, to seed precipitation yielding clouds, or to create other similar conditions leading to rain-fall or simply to induce rain from the already existing clouds. This fact is also very well supported by the Brāhmaṇakāras following observations regarding the precipitation of rain with

the help of *Yajña*.

agnervaidhūmojāyate.
dhūmad abhraṁ abhrāt vṛṣṭiḥ.[21]

That is to say, when *maitra āhutis* or *somīya āhutis* are offered to the *Yajñīya* fire, the smoke (the *vikāra* of waters existing in the mid-sphere) is produced, which, due to the law of specific elementary gravity (See for Details: Vedic Meteorology), goes higher up in the atmosphere (*divaṁ te dhūmo gacchatu*)[22] through the fire column established with the help of celestial fire, the Sun, in conjunction with the air, (*marutaṁ pṛṣati gaccha vasā pṛṣnirbhūtvā divaṁ gaccha*)[23]. There it creates abhra (clouds) and clouds precipitate rain (tato no vṛṣṭ-imāvaha).[24]

Thus the rainmaker, with the help of *Yajña*, is capable

of seeding clouds and stimulate them to rain as and when desired. But in the process, before starting a *Yajña* at any place or time, it is a priory of a rainmaker to make a proper survey of weather or study weather conditions properly. The weather is to be studied in terms of air-motion, i.e., whether the air draft is in a favourable direction or not; in terms of humidity or water vapours, i.e., whether the air is humid enough to reach saturation point or dry requiring further evaporation of water from ground, and in terms of cloudiness, i.e., whether the sky is seeded with clouds or there is no cloud at all. Thus a serious rainmaker should know the weather conditions properly and exactly before carrying out a rainmaking experiment. Different weather conditions would oblige a rainmaker to modify weather differently for rainmaking and this would require different time spans and varied expenses to induce rain with the help of *Yajña*.

Thus from the foregoing, it is crystal clear that the induction of rain or rainmaking depends exclusively on the current weather conditions. The weather may be dry cum hot; dry cum cold; humid cum hot; humid cum cold and accordingly air may be tropical (warm), polar (cold), maritime (humid) or continental (dry). With the help of *Yajña*

(*DevaYajña*), one can modify weather to the extent that it shall favour rainmaking. Following modifications of weather may be effected with the help of *Yajña* in order to induce rain.

Evaporation and cloud formation

If the weather is dry and hot and the west-wind (continental air) is under sway, a rainmaker is required to do vāyuviloḍana or ākāśa-manthana, i.e., an atmospheric stirring. For this, the air is heated up and made to flow around turbulently so that a high evaporation of water from the ground or sea may easily be generated. See for example the following hemistich of the *RV*.

Saṁ no iṣiro vātu vātaḥ.[25]

'let the rain-precipitating winds blow from all directions.'

This is well-supported by the following verse of the AV.

Prajāpati salilādā samudrādāpa
Iryannudadhimardayāti.

Udīryat marutaḥ samudratastaveṣo
Arko nābhā ut pātyātha.[26]

'The Sun assisted by air evaporates the terrestrial waters into celestial ones and makes them fall on the earth in the form of rain.'

The similar observation is made by the *Bṛhaddevatā*.

Rasāna raṣmibhirādāya,
Vāyunāyaṁ gataḥ saha

Varṣatyeṣa ca yalloke
Tenendra iti smṛtaḥ.[27]

'The Sun in conjunction with air conducts evaporation of fluid substances from the earth.'

For this type of heating and airflow Vāruṇi āhutis are offered to the *Yajña*. It augments the power of Varuṇa deity or the āgneya element in the atmosphere. Thus strengthened by āgneya ahutis, the varuṇa element heats up the atmosphere and

makes the air flow strongly. Thus two-three days of atmospheric stirring enables air to receive sufficient moisture required for saturation. Afterwards, condensation starts and clouds begin to form. But this is not sufficient to induce a good amount of rain. This is only the first phase of the process.

Persistence of sea bearing winds

For the sufficient rain, it is necessary for the moisture/rain/sea bearing winds and clouds to persist. In the context of Indian sub-continent, as it is well known, only the east-winds/monsoons bring moisture and rains.

Hence, with the help of *Yajña* the somīya substance is sprayed in the atmosphere to augment the somīya content of the air, which helps deflect the sea bearing winds.

Persistence of clouds and precipitation of rain

For a cloud to persist, *Yajña*-kuṇḍa is maintained continuously day and night in order to keep the air ascending/slightly moving upward. Actually, when the *Yajña* is performed, the surrounding air is heated up and gets an upward thrust. This fact is also corroborated by the Vedic seer as:

swāhākṛte ūrdhavaṁ nabhasaṁ marutaṁ gacchatam.[28]

'When the *Yajña* is started, the air is accelerated upward.'

This upward moving air helps the clouds induce rain. This function of air is confirmed by the following authorities of Vāyupūrāṇa.

meghā vāyunighātena
viṣṛjanti jalaṁ bhuvi.[29]

abhrasthāḥ prapatantyāpo
vāyunā samudiritāḥ.[30]

Maitrāiṇi Saṁhitā also bears out the same fact, as;

maruto'mutaścyāvayanti etc vai vṛṣṭyāḥ pradātāraḥ.[31]

This is also well-supported by the following authorities of the AV. e.g.,

marudbhiḥ prachyutā meghā varṣantu pṛthivimanu.[32]

marudbhiḥ pracyutā meghā saṁyantu pṛthivimanu[33]

samabhrāṇi vātajūtāni yantu.[34]

upapruto marustanairyata vṛṣṭiryā viśvānivataspṛṇāti.[35]

This process, as the experience had it, will take three to fifteen days to induce rain.

Secondly, there is likely that the favourable wind, i.e., sea bearing wind is already blowing and the sky is also cloudy. Under such conditions, a rainmaker is required to introduce such somīya contents in the atmosphere as could act as super-seeding agents. Clouds thus superseded would be able to yield rain within 24 or some more hours. This fact has been disclosed by the Bṛhadāraṇyakopaniṣad thus,

parjanyo vāgnirgotama tasya saṁvatsara eva samidabhrāṇi dhumo vidyudarcciraśanir aṅgārā hrādunayo visfuliṅgāstasminnetasminnagnau devaḥ somam rājānaṁ juhvati tasya āhutyai vṛṣṭiḥ saṁbhavati.

'O Gotam ! parjanya (the cloud) is the second sacrificial alter. It has the year as its samidhā (sacrificial fuel), abhra (supercooled cloud) as its smoke, lightning as its flame, aśani as its ember and the thunder sound as its spark. This could be induced to rain by way of augmenting the somīya element in the atmosphere with the help of somīya āhutis.'

Nature of Āhutis

The aforementioned disscussion regarding the method of inducing rain with the help of *Yajña* remains uncomplete so long as the nature of *somīya* and *vāruṇī āhutis* is not defined. Hence, a detailized break-up of *somīya* and *vāruṇī āhutis* in respect of various climatic conditions is rendered hereunder.

To start with, it may be pointed out that for the sake of rainmaking or anti-rain experiments, climatic conditions should be studied into six types in the light of the variables of coldness and hotness in respect of humidity and aridity.

In this way the six climatic types to be worked out will be as:

1. maritime polar (humid cum cold),
2. maritime tropical (humid cum hot),
3. maritime temperate (humid cum equable).
4. continent polar (arid cum hot),
5. continental tropical (arid cum hot) and
6. continental temperate (arid cum equable).

Similarly, *āhuti dravya* (offering material) is composed of *auṣadhis* (vegetation) grown in various climatic conditions. From the point of growth of vegetation to be used as *āhutis* in humid or arid regions, the vegetations are classified as *somīya* and *āgneya* respectively and so are the *āhutis.*

Somīya Āhutis

As is clear from the foregoing discussion, *somīya āhutis* are composed of *somīya* flora or vegetation growing in humid regions. They may be classified into three categories in respect of their growth in high, low or equable temperatures. For instance :

(1). *Somīya* or maritime flora growing in polar climatic conditions. The vegetation growing in low temperature high humidity and with heavy rainfall may be classified as such. Evergreen oaks, chestnuts and chirpine trees are this type of vegetation which is located in upper Himalayan regions especially in eastern and southern zones.

(2). *Somīya* or maritime flora growing in tropical conditions. The vegetation growing in high temperature, high humidity with heavy rainfall in same climatic conditions is

though hardly traceable in Indian peninsula, we have regions with slight variations i.e. with high temperature, comparatively low rainfall between 100 and 200 centimeters per annum, such as Foothills of Himalayas, Western ghat in south and Shivalika in north. The vegetation growing in the above named regions is known as tropical deciduous forests. Teak, sal, sandalwood, *shisham,* rosewood ebony, *mahua,* bamboos are this type of vegetation. Rice, coconut, sugarcane, tea and spices like blackpepper, chillies, ginger and cardamom also grow under similar climatic conditions.

(3). *Somīya* or maritime flora growing in temperate conditions : The vegetation growing in even or moderate temperature, high humidity and heavy rain falls under this category. This type of climatic conditions are found in Western Ghat, hills of Assam, West Bengal and Orissa. The evergreen and semi-evergreen forests growing in the above mentioned regions belong to this category. Tea also belong to this class of vegetation.

Vāruṇī Āhutis

(1). *Vāruṇī* or continental flora growing in polar conditions. The vegetation growing in low temperature, aridity and scanty rainfall belong to this category of flora. This type of climatic conditions may be traced to the northern most area of Laddakh in Kashmir and Kinnaur and Lahul Spiti in Himachal Pradesh. The pines, fire and alpine variety of vegetation and other shrubs, scrubs and grasses growing at the altitude of 2000 or above belong to this category. Herbs like *somalatā* are also of this type.

(2). *Vāruṇī* or continental flora growing in tropical conditions. The vegetations growing under the conditions of high temperature, aridity and scanty rainfall may be categorized as such. Desert of Thar in India is the hot continent, so the shrubs, scrubs and thorny bushes growing in the desert of Thar are this type of vegetation. Moreover, horsegram and the millets or coarse grains like *Ragi, Jwar* and *Bazra* also belong to this category of vegetation.

(3). Vāruṇī or continental flora growing in temperate conditions. The vegetation growing in moderate or even temperature, aridity and scanty rainfall falls under this category. Mustard and wheat are some examples of this type.

Here it may be clarified that vegetations always abound with such met. Qualities as were prevalent in the weather during their growth. For instance, if a particular vagetation grows in rainy conditions, it will also abound with rain promoting qualities. If a particular vegetation grows in the conditions of aridity, it will augment aridity. Similarly, the vegetations growing in polar or tropical conditions will augment polar and tropical conditions in weather. The *Vajasaneyī* seer has clearly pointed out this fact in one of his verses as :

'varṣavṛddhamasi prati tvā varṣavṛddaṁ vattu.'[23]

'Since you have grown in rains, one should know you as rain promotor.'

While commenting on this verse, *Ś. Br.* examplifies the rain-promoting agents like rice, reed and bamboo. For example, it had it as :

'atha śūrpam ādattle varṣavṛdhaṁ hyetadyadi naḍānāṁ yadi vetūnām yadīṣikāṇāṁ varṣamuhyevaitā vardhayati.'[24]

'He then, in application of first part takes hold of a winnowing basket made of dried straw, reeds or bamboo. Since, straw, reeds or bamboo have grown in rain, promote rain'

Further in connection with the second part of the verse i.e.

prati tvā varṣavṛddhaṁ vettu, he maintains as 'atha havirnirvapati, prati tvā varṣavṛdhaṁ vettviti. varṣ avṛddhā uhyevaiti. yadi vrīhiyo yadi yavā varṣamuhya ivaitān vardhayati tatsaṁjñām eva etat śūrpāya ca vadati nedanyo'nyaṁ hinsāta iti'.[25]

'In application of second part, the oblation is prepared to be offered to the *Yajñiya* fire in the winnowing basket. The oplation is made of the rain promoting vegetation. Rice and

barley grow in rain and so promotes rain. Hence they are taken for oblation tn the winnowing basket made of dried straw, reeds or bamboo. Rice and barley are collected in the basket of straws, reeds or bamboo, since both rice and straw/reeds/bamboo are rain promotor. They are not anti to each other.'

Thus in view of the facts and circumstances discussed above, it can unhesitatingly be maintained that rainmaking and prevention of rain (to be discussed in the next chapter) is a matter of co-ordination between the six climatic conditions and six types of vegetations to be offered in the *Yajñiya* fire depending upon the careful selection and handling of *āhuti dravya* (vegetation) in respect of the prevalent climatic condition.

Eventually it can be held that this thrilling idea of rainmaking or anti-rain with the help of *Yajña* is not only cherished by the present author and the Rainmaker, but modern scientists have also reached to some nonetheless thrilling conclusions, such as (1) the better effectiveness of silver-iodide as a cloud seeding material when introduced in the sky in the form of smoke from the ground with the help of surface burners or ground generators than when delivered by airplane.[36] (2) Burning sugarcane in eastern Australia is thought to have reduced precipitation near the burning areas through over-seeding.[37]

These conclusions of modern meteorologists also

validate the authenticity of the idea of rainmaking and anti-rain with the help of *Yajña* (Deva *Yajña*).

To sum up, it can unhesitatingly and safely be said that the Vedic science of *Yajña* is based on concrete and scientific ideas which need to be revived and revitalised. Through these lines, the author would like to invite the attention of the World Governments and scientific bodies that they should come forward to save this scientific treasure of the Vedas from being threatened by extinction and preserve, popularise and promote this ancient tradition of *Yajña* by establishing *Yajña*

saṁasthānas.

Notes & References

1. Mason (1975: 124)
2. *VS.* 18.9
3. *Ibid.* 22.22
4. *Ibid.* 2.16
5. *AV.* 5.24.5.
6. *VS.* 33.3
7. *AV.* 3.10.9.
8. *Kath.S.* 30.10; *Kath.S.* 46.8; *TS.* 3.2.1.4; *S. Br.* 1.7.1.5.
9. *S.Br.* 5.3.5.17.
10. *Bṛhadāraṇyakopaniṣad*, 6.2.10.
11. *Gita*, 3.14
12. *Ibid.* 3.15
13. *Bṛhadvimānaśāstra*, 13.19.
14. *Ibid.* 22.48.
15. *Ibid.* 22.49.
16. *Ibid.* 22.50.
17. *Ibid.* 15.91.
18. For details, see author (1993:44 - 66), also (1995)
19. *VS.* 33.3.
20. *Nir.* 2.16.
21. *S.Br.* 5.3.5.17.
22. *VS.* 6.29.

23. *VS*. 2.16.
24. *Ibid*.
25. *RV*. 1.35.4.
26. 4.12.2.
27. 1.68.
28. *VS*. 6.11.
29. *Vāyupurāṇa*, 51.15.
30. *Ibid*. 51.25.
31. 2.4.8.
32. *AV*. 4.12.8.
33. *Ibid*. 4.12.8.
34. *Ibid*. 4.12.1.
35. *Ibid*. 6.22.3.
36. Herbert (1965: 115)

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