

An Overview of the Indian system of Raagas and their Positive Effects on Health

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ABSTRACT

Music is often known to stimulate the neurological physiology as well as physical health due to its therapeutic abilities. This article presents a detailed review about the Indian classical music (ICM) Raagas with their relationship to the time of the day during which it is played, the season of the year during which it has a maximal positive effect as well as its relationship to Vaatha, Pittha and Kapha. Two sample case studies with melodic scales are reviewed wherein the first case study relates to the successful stress reduction using Darbari Kanada Raaga for subjects undergoing gastroendoscopy and the second one highlights the reduction of blood pressure and heart rate for hypertensive women in their third trimester of pregnancy. A meaningful conclusion is drawn by providing a comprehensive assessment about these two case studies thereby emphasizing on the positive effects of music therapy.

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Introduction

Indian classical music (ICM) encompasses seven full notes (Shudh swara) and five derived/half notes (Vikrutha swara) [1,2]. It is also based on twelve pitch (Shruthi), which in turn is addition of full and derived notes. If the frequency of a given note is more than its mean value, then it is termed to be a Teevra swara. Similarly, if it is decreased below the mean value, then it is called Komal swar. Raaga is the essence of Indian Classical Music (ICM) inherently used to express the melody (Bhaava) [3,4]. Raaga is a combination of notes (Shudh or komal) in an ascending/descending order. Raagas seem to have a highly positive effect on the human body, as per the Sangeetha shastra. Certain notes of the music elicit an emotional variation as well as stimulate the brain so as to improvise the neurological functions of the human brain [5]. Such aspects will also help to cure certain diseases. But researchers seem to have neglected the uses of music therapy as compared to the conventional medicinal approaches. The reason for this may be due to the non-linearity of music therapy, as it seems. For instance, a certain Raaga may have a positive effect on a given subject while the other may have a negative effect. While certain effects may be very fast, the others may respond very slowly. There is very less evidence in modern literature about the healing effects of Raagas of ICM. The present article provides an insight into different Raagas and their classification as well as their therapeutic effects with a plausible scientific basis to the same, as per present available literature.

Classification of Raagas

Although there exist numerous ways to classify a given Raaga, there are 4 prominent approaches for the classification namely notes, time of the day, that and the Emotion (Rasa) [6].

Note Based Classification

Raagas are classified with regard to the swaras (notes) embedded in them into three categories namely Sampoorna (Raagas containing all the seven swaras in the aaroha and avaroha), Shadhava (Raagas containing six swaras in the aaroha and avaroha) and Audava (Raagas containing 5 swaras in the aaroha and avaroha). These are further categorized into Audhava-Audhava, Audhava-Shadhava, Shadhava-Audhava, Shadhava-Shadhava, Sampurna-audhava, Sampurna-Shadhava, Audhava-Sampurna, Shadhava-Sampurna subcategories. Table 1 provides an insight into the number of notes for different categories [7,8].

Table 1: Classification of Raaga based on number of notes in a scale

Name	No of notes	Name of The Raaga	Number of swaras
Sampoorna	7	Yaman	Ni Re Ga Ma(Teevra) Dha Ni Sa
Shadhava	6	Sohini	Sa Ga Ma(Teevra) Dha Ni Re(Komal) Sa
Audava	5	Bhoop	Sa Re Ga Pa Dha Sa

As an example, on the basis of table 1, in case of Sampurna type, Raag Yaman has an aaroha of Ni Re Ga Ma (Teevra) Dha Ni Sa. The avaroha is Sa Ni Dha Pa Ma (Teevra) Ga Re Sa. Similarly, in case of Shadhava, Raag Sohini has an Aarohan of Sa Ga Ma (Teevra) Dha Ni Re (Komal) Sa and an Avarohan of Sa Ni Dha Ma (Teevra) Ga Re (Komal) Sa. Also, in case of Audava, as seen in Raag Bhoop, one can see an Aarohan of Sa Re Ga Pa Dha Sa and an Avarohan of Sa Dha Pa Ga Re Sa. In Shadhava Sampurna, as seen in Raag Sohini, Aarohan is of the form Sa Ga Ma (Teevra) Dha Ni Re (Komal) Sa and Avarohan is Sa Ni Dha Ma (Teevra) Ga Re (Komal) Sa. Similarly, Audhava Sampurna as portrayed by Raag Bageshri, Aarohan is seen to be Sa Ga (Komal) Ma Dha Ni (Komal) Sa and Avarohan is of the pattern Sa Ni (Komal) Dha Ma Pa Dha Ma Ga (Komal) Re Sa. Such a classification approach is useful to differentiate between different Raagas on the basis of the number of notes on the same.

Time Based Classification

Based on the time of the given day, the Raagas are classified into different categories for every 4 hours of time interval. It is also obvious to mention that such Raagas are best played during that particular time of the day for having the best effect, according to the combination of swaras present in the Raagas. For example, Ahir Bhairav is classified as a morning Raaga due to a combination of shudh ma along with komal re and komal dha present. Andolan (modulating) note of re and dha provides a predominant feeling of the morning time of day and hence considered to be a morning Raaga [9]. A comprehensive time-based classification of Raagas is provided in figure 1.

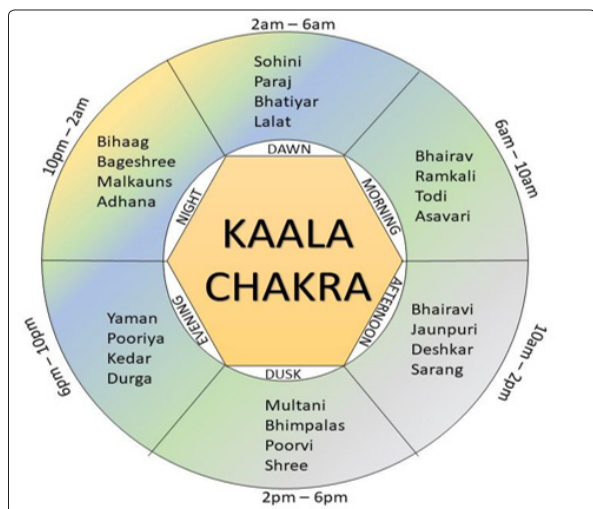


Figure 1: Time based classification of Raagas (Prahar based)

Thaat Based Classification

There exists ten thaats made of a combination of komal and shuddh swaras. These ten thaats form the basis for the other Raagas to be derived in the Hindusthani music. Thaats, in a way is considered to be a parent Raaga. The ten thaats forming the basis for the other Raagas are Bilaval (which included shuddh swaras), Khamaj (with a komal Ni), Kafi (with a komal Ga and Ni), Asavari (with a komal Ga, Dha and Ni), Bhairavi (With a komal Re, Ga, Dha and Ni), Bhairav (With a komal Re and Dha), Poorvi (With a komal Re and Dha and theevra Ma), Todi (With a komal Re, Ga and Dha and theevra Ma), Marva (with a komal Re and Theevra Ma) and Kalyan (With a theevra Ma). For example, Raag Sohini is derived from Thaats Marva. Figure 2 depicts the different Thaats and their corresponding Swaras which is essential for the classification of a given Raaga on the basis of Thaats, which is depicted in table 2 [10].

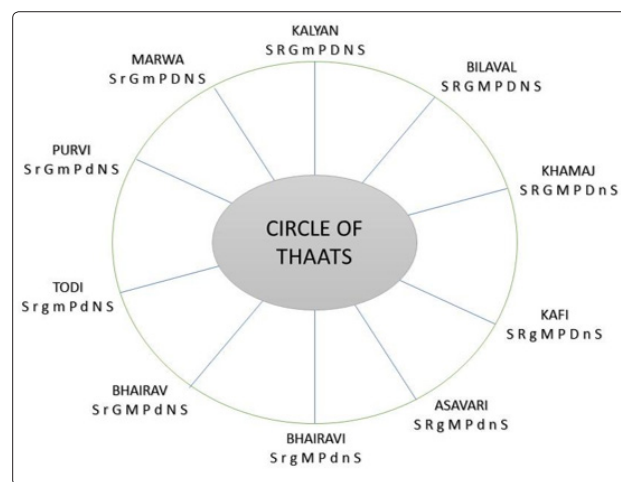


Figure 2: Thaats and their corresponding Swaras

Table 2: Thaats based classification of Raagas

Thaat name	Derived Raagas
Bilaval	Bihag, Durga, Hamsadhvani
Khamaj	Rageshri, Jog, Jayjayvanti
Kafi	Abhogi, Bahar, Dhaani
Asavari	Darbari kanada, Kausi kanada, Jaunpuri
Bhairavi	Bilaskhani Todi, Komal rishab asavari, Maalkauns
Bhairav	Ahir-Bhairav, Gauri, Gunkali
Poorvi	Basant, Lalit, Shree
Todi	Madhuvanti, Multaani, Todi
Marwa	Bhibhas, Sohini, Bhatiyar
Kalyan	Shuddh kalyan, Shyam Kalyan, Bhoop

Rasa Based Classification

Rasa (emotion) is regarded to be an important aspect of ICM. Each Raaga leads to different emotions. Further, every rasa is associated with different gods and colors as well, as per the Indian Vedas. There are nine rasas which forms the basis for the classification of Raagas. Table 3 provides an insight into the different rasas, their presiding deity as well as the corresponding color that it elicits when played in terms of the perception of the same neurologically [11].

Table 3: Rasa based classification of Raagas

Rasa	Emotion	Presiding deity	Colour
Sringara	Love	Vishnu	Light green
Hasya	Laughter	Paramata	White
Raudra	Fury	Rudra	Red
Karunya	Mercy	Yama	Grey
Bibhatsa	Disgust	Shiva	Blue
Bhayanaka	Terror	Kala	Black
Vira	Heroism	Indra	Yellow
Adbhuta	Amazement	Brahma	Yellow
Santa	Peace	Vishnu	Blue

Note that the seven swaras have seven different qualities which are perceived by the individuals. A glimpse of all the swaras and the physiological effects that they are known to induce in the human body is provided in table 4 [12].

Table 4: Swaras and their effects on human body

Note	Quality induced	Color	Effect on human body parts
SA	Reasoning	Red	Anal and sexual organs
RE	Beauty	Orange	Urinary and ovary system
GA	Joy	Yellow	Stomach, liver and pancreas
MA	Love	Green	Heart and lungs
PA	Detachment	Blue	Ear, nose and throat and vocal cords
DHA	Power	Indigo	Eyes
NI	Surrender	Violet	Brain and Nervous systems
Adbhuta	Amazement	Brahma	Yellow
Santa	Peace	Vishnu	Blue

The seven qualities provided in table 4 are considered to be the seven stages of life that human beings experience every seven years. Swaras are considered to be omnipresent in the form of colors around us. These colors induce the corresponding emotions in human beings [13].

Raaga and Energy Stimulation

Human body is considered to host three types of energy centers namely Prana, Apana and Samana [14]. These energies affect the body as well as the mind in different manner. For instance, Prana is the positive energy acting upwards. It helps in the movement of blood and synthesis of hormones. It develops a positive energy in the mind by providing love and hope. Dha, Ni & upper octave swaras stimulate Prana in the body and mind. Similarly, Apana is the negative energy acting downwards. It reduces the movement of blood and synthesis of hormones. This is also responsible for the excretion of urine and semen. It develops a negative energy in the mind generating a feeling of hatred and despair. Swaras Ma, Ga, Re and lower octave stimulate Apana. Apana helps in the functionality of excretory and reproductive systems in the body. It also helps to gain control over the emotions by getting rid of them, when necessary. Often Prana and Apana are opposite and hence restores the equilibrium in the body and mind. Samana is considered to be neutral thereby balancing both positive and negative forms of energy. It is responsible for the movement of blood and hormones and is also known to control the breathing action. The mind is retained balanced due to this energy. The swara Pa stimulates Samana and restores the balance & co-ordination in the human body and mind [15].

Raaga and Energy

Consider the examples of Bhoop, Hamsadhwani, Ahir Bhairav, Darbari, Todi, Pooriya and Bageshri Raagas, in terms of the Prana, Apana and Samana energy generation. Often it is the gaps/pause between the swaras which seem to provide a therapeutic effect than the Raaga itself.

Bhoop: In case of Bhoop, the absence of swaras Ma and Ni causes two vacuum zone where the healing is supposed to occur. Ma is considered to be Apana which causes the vibration of the heart chakra resulting in a negative emotion. However, the absence of Ma reduces the negative emotions and provides a good mood with happiness to the listener. Swara Ni which falls in the category of Prana creates a vibration in the crown chakra thereby induces a feeling of surrender. The absence of Ni removes this feeling and the listener perceives a feeling of happiness, responsible, positive

and self sufficient as well. Swaras Re, Ga, Pa and Dha of this Raaga improves the functionality of Ovaries and eyes [16].

Hamsadhwani: There is an absence of swara Ma and Dha in this Raaga. Ma vibrates in the heart chakra and creates a feeling of love, peace and negative emotions. But the absence of swara Ma helps to detach from all the worldly pleasures and expectations. Swara Dha vibrates in brow chakra, induces supranormal powers. Absence of this swara helps to detach from such powers and mitigate them. Hence this Raaga provides emotional control, stability and well as improves the intellectual ability of the individual.

Darbari: This Raaga is known to help relax and reduce the tension. This is a late-night Raaga which is known to be composed by the famous musician Tansen for king Akbar to relieve his stress and tension.

Todi: This Raaga normalizes the blood pressure in hypertensive subjects and also provides a solution to cold and headache [17].

Ahir Bhairav: Ahir bhairav helps in reducing the blood pressure in hypertensive subjects.

Pooriya: This Raaga induces a sweet and a stable state of mind and provides calmness. This is also found to be useful in the reduction of acidity in individuals [18].

Bageshri: This Raaga is responsible for a feeling of depth as well as calmness of mind. This is used to address the issues of hypertension as well as diabetes in subjects.

Raagas and their relationship with Vaata, Pittha and Kapha
Ayurveda describes three major aspects (Dosha) in human beings namely Vaata, Pittha and Kapha [19]. These aspects are often correlated to the basic elements of nature as well.

Vaata: Corresponds to space and air. It also related to aspects in motion. Vaata is known to manage biological activities in living beings and is often termed as “King of Doshas”. It also provides motion to Pittha and Kapha. The attributes of Vaata in the physical as well as psychological traits in the body correspond to dry, cold, subtle and mobile. The organs associated with this dosha are colon, thighs, bones, joints, ears, skin, brain, and nerve tissues. In terms of human physiology, Vaata controls movements such as those of breathing, speaking, nerve impulses, movements in the muscles and tissues, circulation, assimilation of food, elimination, urination, and menstruation. Psychologically, Vaata controls communication, creativity, flexibility and thought reflex [20].

Pittha: Reflects the basic elements fire and water and is considered to be derived from the same as well. Pittha is the reason behind the physiological processes such as those of digestion as well as metabolism in the human body. It is known to emphasize organic acids, hormones, enzymes, and bile juice. Although Pittha portrays the element of Agni (fire), the fluid nature of pittha corresponds to the elements of water as well. The physical qualities of Pittha are oily, sharp, hot, light, moving, liquid, and acidic which are seen in individuals in the state of Pittha often. The organs associated with Pittha are Small intestine, Stomach, Liver, Spleen, Pancreas, Blood, Eyes, & Sweat. Physiologically, pittha attributes to the generation of heat as well as the energy in the body, due to the process of metabolism in the cells. Psychologically Pittha corresponds to Joy, Courage, Willpower, Anger, Jealousy, Mental perception and the intellectual ability as well [21].

Kapha: Reflects the elements Jala (water) and earth. It provides the human body with physical strength, structure as well as contributes towards the functional aspects of the organs. Kapha is characterized by Moist, Cold, Heavy, Dull, Soft, Sticky & static qualities which are reflected in the individuals portraying kapha in their body. Anatomically, kapha is seen in the Chest, Throat, Lungs, Head, Lymph, Fatty tissue, Connective tissue, Ligaments & Tendons. Physiologically, Kapha moistens food, lubricates joints, stores energy and controls the body fluids such as those of water, mucous and lymph. Psychologically, Kapha manages traits such as those of Love, Patience, Forgiveness, Greed, Attachment & Mental inertia. Most importantly, Kapha has an evident effect on Vaata and Pitta and also helps to retain a balance between all the doshas [22].

Raagas are often synonymic with seasons and hence names accordingly as well. For instance, Varsha ruthu (rainy season) is linked to Megha and Malhaar Raagas. Similarly, Sharad ruthu (Autumn season) correlates with Basanth Raaga and Vasantha ruthu (Spring season) is linked to Bahar Raaga. These Raagas are supposed to be played during their corresponding seasons, either during the day or night and such Raagas are not time specific [23]. A detailed depiction of different seasons with the associated months as well as the corresponding Raagas is provided in figure 3.

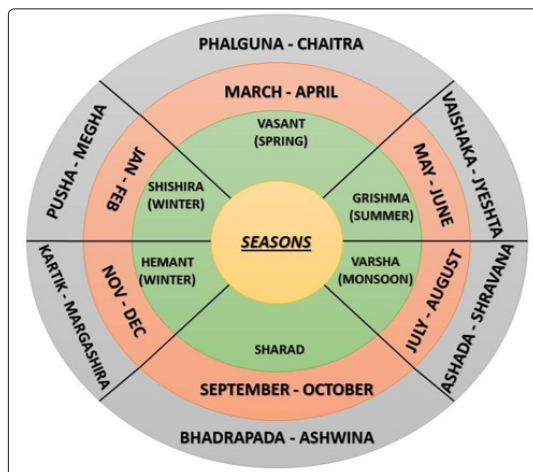


Figure 3: Raagas and their associated seasons (Ruthus) and the corresponding months

Two cycles (namely C1 and C2) are seen in the human body for every 24 hours, with each cycle ranging for 12 hours. There is a visible predominance of either Vaata, Pittha or Kapha for a 4-hour duration each, for every cycle of the day. C1 corresponds to the first cycle ranging from 6.00 am to 6.00 pm every day. In other words, Kapha is seen between 6.00 am to 10.00 am, Pittha is seen during 10.00 am to 2.00 pm and Vaata is seen during 2.00 pm to 6.00 pm of the day. The second cycle C2 corresponds to 6.00 pm to 6.00 am. Kapha is seen during 6.00 pm to 10.00 pm, Pittha exists from 10.00 pm to 2.00 am and Vaata is again seen during 2.00 am to 6.00 am.

There has been evidence to correlate these doshas with the Raagas as well as the related seasons along with the time of the day. The doshas are known to be in a balanced state with the corresponding Raagas being played. In other words, when appropriate Raagas are provided to the individuals suffering from an imbalance of these doshas, as per the time of the day and the season, the balance of the doshas in the body is known to be retained. For eg, if kapha is in a reduced state in a given individual, then one could play Bhairav Raaga to such an individual in Shishir ruthu during 6.00 am to 10.00 am (in cycle 1) or 6.00 pm to 10.00 pm (in cycle 2). This would accumulate the Kapha (increase the kapha) in the body. But if an individual is known to have an excess kapha, then playing Raag Hindol in Vasanta ruthu would eliminate the kapha is played during 6.00 am to 10.00 am (in cycle 1) or 6.00 pm to 10.00 pm (in cycle 2). On the contrary, if there is a marginal increase in Kapha, then playing Raag Deepak in Grishma Ruthu during 6.00 am to 10.00 am (in cycle 1) or 6.00 pm to 10.00 pm (in cycle 2) would reduce this effect and bring back the balance of Kapha [24]. A detailed description of Seasons along with the Raagas associated as well as the time to be played is provided in table 5.

Table 5: Relationship between Doshas, Raagas and the cycles with their corresponding effects

Dosha	Accumulation	Vitiation	Diminution
Kapha Cycle 1: 6.00 am to 10.00 am Cycle 2: 6.00 pm to 10.00 pm	Shishir Eg: Bhairav	Vasant Eg: Hindol	Grishma Eg: Deepak
Pitta Cycle 1: 10.00 am to 2.00 pm Cycle 2: 10.00 pm to 2.00 am	Grishma Eg: Deepak	Varsha Eg: Megh	Sharad Eg: Malkauns
Vaatha Cycle 1: 2.00 pm to 6.00 pm Cycle 2: 2.00 am to 6.00 am	Varsha Eg: Megh	Sharad Eg: Malkauns	Hemant Eg: Shree

Discussions and Conclusions

Based on the description provided in the preceding sections, there seems to be an evident effect of Raaga on the physical, physiological as well as psychological well being of an individual. But the prime attribute would be to provide the exact Raaga during a particular season at a specified time of the day, for eliciting the desired effect. It is hence obvious to ascertain that music therapy is based on attributes such as those of time, seasons and also the way in which it is being administered for obtaining a fruitful change/improvement in the individual. There have been a few experimental studies that have used Raagas in certain medical conditions.

In one such study, 104 subjects undergoing gastro endoscopy were randomly divided into music intervention group and control group. Raaga darbari Kanada was played for 10 minutes before the endoscopic procedure and continued throughout the procedure. The control subjects were not played any music, and were made to wait before the endoscopy, as is done routinely and were asked to remain calm through the procedure. Both the groups were not anesthetized during the endoscopic process. Cardiovascular parameters such as those of blood pressure, heart rate as well as the respiratory rate were recorded for both the sets before listening to music and after the endoscopic procedure as well. The results showed a definite statistical variation in the recorded parameters with and without the administration of Raaga darbari Kanada for conditioned and control set of subjects in terms of blood pressure (systolic/diastolic). Such a definite variation with music intervention proves the usefulness to reduce the psychological stress in subjects undergoing procedures such as those of endoscopy.

In another similar study, 60 hypertensive women in their third trimester of pregnancy were considered to assess the time-based variations in Raagas. The subjects were randomly divided into intervention and control sets (30 in each category). The intervention was three sessions of receptive music therapy with relaxing music using Raaga bhoopali Todi. The first session was performed at 8.30 am. The second session was performed at 3.00 pm and the third session was planned at 8.30 am (the next day). Each session lasted for 15 minutes. The music was composed using flute and piano (both played together). The Blood pressure (BP) and Heart rate (HR) were measured before the first session, after the second session and before the third session for conditioned set of subjects while the same parameters were acquired for control set of subjects, without the administration of any music therapy. A statistical analysis of the results obtained revealed an improvement in both blood pressure and heart rate due to the induction of music therapy in the case of conditioned set of subjects. (Before music therapy: BP 123/ 86 bpm and heart rate: 93. After music therapy: BP 118/ 83 bpm and heart rate: 90). This variation was not seen in control set of subjects due to the absence of Music therapy. This proved an evident positive effect of music in hypertensive pregnant women in their third trimester. In another similar study, 40 hypertensive candidates (42.5% of male and 57.5% of female) within the age barrier of 30 to 60 were made to listen to Raag Ahirbhairav for the period of twenty minutes each. The BP of these subjects (both systole and diastole) were recorded twice, once before the administration of Raaga and then, again, after the administration of Raaga. The mean value of pre-test score of Systolic Blood Pressure (Pre-hypertension) was 156.2, Diastolic Blood pressure (hypertension stage-I) was 97.6, and the Blood pressure (Hypertension stage-II), was 117.1.

Before the implementation of Raag Ahirbhairav. The mean value of post-test score of Systolic Blood Pressure (pre-hypertension) was

151.1, Diastolic Blood pressure (hypertension stage-I) was 93.8 and the Blood pressure (hypertension stage-II) was 112.9 after the implementation of Raag Ahirbhairav it was attributed to the impact of Raag Ahirbhairav in decreasing the level of hypertension with changed Systolic Blood Pressure (Post-test) was 151, Diastolic Blood Pressure (Post-test) was 93, Blood Pressure (Post-test) was 112. Hence it was observed that each subject had a mild reduction in their blood pressure values after the implementation of Raag Ahirbhairav when compared to their pretest score.

In yet another recent study by Kunikullaya et al., Raaga Bhimpalasi has been found to significantly reduce the BP of prehypertensive after 3 months of intervention with music combined with lifestyle modifications [25-28].

Above mentioned case studies enumerate the positive effects of music intervention. There are numerous other studies which have proved the effects of Raagas in the improvement of physical, physiological as well as the psychological status of the individual. As observed, very few studies have elaborated on the reasons for using a particular Raaga for music intervention. There are only a handful of studies that have taken into account the timeline with regard to the Raagas (praharas) as well as the choice of scale for the given condition of patients. While music intervention is gaining importance as an alternative approach in healthcare, there lies abundant work to be done in this field. However, Music therapy seems to be a promising solution to various disorders without any known adverse effects on the individuals. The cost effectiveness and simplicity of intervention adds further value. One could only predict an increase in the incorporation of music intervention in healthcare due to such positive effects in the near future.

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