

Chapter - 7

Ragas
or
Melodies

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Ragas or Melodies

The concept of a Raga in Indian classical music is a unique one. There is not analogue of a Raga in any other system of music and, therefore, it is very difficult to translate this word in English. However, Raga is usually translated as "*Melody*" and we shall accept the same convention.

A Raga can be defined as a group of five or more notes chosen from a Thata and bound by a set of rules (*basically in the nature of restrictions leaving room for infinite combinations of notes to be constructed*) so that the notes can be now sung or played. It must be pointed out that a Thata cannot be sung. It is just a raw material for the construction of a Raga. It had to be generally rich in musical relationships so that the Raga arising out of it could also be so (*although we came across Thatas which are in use but not musically rich. In such cases the notes for the Raga have to be picked up in such a way that the group is musically rich*).

Before coming to the actual rules of the Ragas, it will be worthwhile to discuss how their ancient prototypes "*Jatis*" were defined and how they evolved out of Grams and their Murchhanas.

As has been mentioned earlier, each Gram gives rise to seven Murchhanas by taking each of the notes Sa, Re, Ga, Ma, Pa, Dha, Ni as the starting notes. The next stage after Murchhanas by omitting one notes at a time. The Taanas omitting one note were called "*Shadava Taanas*" and those omitting two notes were called "*Oduva Taanas*". Any note in "*Shadava Taana*" and any pair of notes in "*Oduva Taana*" could not be omitted; there were certain restrictions.

These were :

1. Madhyam was never omitted. This note was called "*Avinashi*" or indestructible. We have already noticed that this note was given a lot of importance by the ancient musicians.
2. In Shadaj Gram only Sa, Re, Pa and only the pairs Sa-Pa, Re-Pa and Ga-Ni in Oduva Taanas.
3. In Madhyam Gram only Sa, Re and Ga would be omitted and in Oduva Taanas only Ga-Ni and Re-Dha could be omitted.

Since, only Shadaj Gram and Madhyam Gram were in use in ancient times, the Taanas obtained from them were all the Taanas in use.

The four Shadava Taanas of the Ga Murchhana of Shadaj Gram are given below as an example

Ga Ma Re Dha Ni - Re	(committing Sa)
Ga Ma Pa Dha Ni - Sa	(committing Re)
Ga Ma - Dha Ni Sa Re	(committing Pa)
Ga Ma Pa Dha - Sa Re	(committing Ni)

Similarly, the three possible Oduva Taanas of the Ga Murchhana are given below

Ga - Ma - Dha Ni - Re	(committing Sa - Pa)
Ga - Ma - Dha Ni - Sa	(committing Re - Pa)
Ga - Ma - Pa - Dha - Sa - Re	(committing Ga - Ni)

It can easily seen, that according to the above scheme, there can be four Shaadav Taanas of each of the seven Murchhanas of Shadaj Gram and three Taanas of each of the seven Murchhanas of Madhyam Gram. Thus, there can be $7 \times 4 + 9 \times 3 = 49$ Shaadav Taanas from both these Grams. similarly there can be $7 \times 3 = 21$ Oduva Taanas of Shadaj Gram and $7 \times 2 = 11$ Oduva Taanas of Madhyam Gram, the total number of Oduva Taanas being 35 in both the Grams. hence, in all 84 Taanas have been described in ancient literature.

On what basis the rules for omission of the single notes or pairs of notes were made for Shadaj and Madhyam Gram is not known. There appears to be no doubt, however, that Taanas were evolved to explore the effect of the notes of the various Murchhanas when a note or a pair of notes is omitted. We shall come to Taanas later.

Jatis were constructed from the Murchhanas and then Shadava or Oduva Taanas.

To be more precise,

a Jati associated with a Murchhana or Taana was defined by the following characteristics:

1. Ansha Swara

A note called the "Ansha" was the backbone of a Jati without which the Jati without which the Jati (or Raga), on which the Jati form is based, which generates the particular flavour or colour of a Jati, the predominance of which is evident upto five note below and five notes above, which is combined with other notes in a special way, which makes the notes related to it by Shadaj Pancham or Shadaj Madhyam Bhav also important and which is given extra importance while singing or playing the notes in a special way.



This makes the notes related to it by Shadaj Pancham or Shadaj Madhyam-Bhav also important and which is given extra importance while singing or playing the notes known as Graha, Nyas, Apanyas and Vinyas (*to be defined later*). The idea is that the note "Ansha" is the kingpin of the Jati and the main characteristic form and flavour of a Jati depends upon Ansha. There can be more than one notes as Ansha.

2. Graha

The note "Graha" is the same as Ansha where there is only one Ansha note. When there are more than one Ansha notes, Graha is that Ansha note. By which the singing of a Jati is begun. Hence the starting note of a composition is called Graha which may be the Ansha if there is only one Ansha or may be one of the Ansha notes if there are more than one of them.

3+4. Tar and Mandra

This specifies the range of singing. This upper range is usually four, five or seven notes above the Ansha note. Thus the Ansha note determines the upper limit (*which may be in Tar Saptak*) of the Jati. For the lower limit the rule prescribes that is allowed to go in Mandra Saptak four, three or seven notes below Ansha, Nyas and Apanyas notes. These rules regarding the range of singing are followed in the modern Raga also although not so strictly.

5+6. Nyas and Apanyas

The note on which the singing ultimately ends is called Nyas and when a part of the singing ends is called "Apanyas". 21 Nyas and 56 Apanyas notes have been enumerated by Bharat for all the Jatis.

7+8. Alpatva and Bahutva

The note which is used very frequently although it is neither Ansha nor related to it by Shadaj-Pancham is Shadaj Madhyam Bhav is said to be used in Bahutva (*Bahutva means abundance*). The opposite of Bahutva is Alpatva which means infrequent use of particular note. These rules specify which notes (*apart from Ansha*) are used in abundance and which are used infrequently.

9+10. Shaadavatva and Oduvatva

The Jatis derived from Shaadav Taanas are called Shaadav. Jatis and those derived from Oduva Taanas are called Oduva Jatis (*those which are derived from complete Murchhanas are called Sampoorna Jatis*).

The above characteristics are in the nature of general rules specifying certain notes which get importance as Ansha, certain others which are used frequently (*Bahutva*), the notes from which singing or playing is to be started (*Graha*) and the notes where the singing or a part of it ends (*Nyas and Apanyas*). also, the ranging of singing is prescribed by Mandra and Tar rules. Having defined a Jatis now we come to various categories in which Jatis have been defined.

Bharat has divided Jatis into two main categories : Shuddha & Vikrata

Shuddha Jatis

These are derived from Murchhanas which means that use all the seven notes. Also, it is prescribed that Graha, Ansha and Nyas should be the same note in a Shuddha Jati and it should be the starting note of the Murchhana.

All Murchhanas of Shadaj and Madhyam Gram have not been associated with Shuddha Jatis.

The following are the seven Shuddha Jatis mentioned by Bharat

- | | |
|-------------|-------------------------------------------------|
| 1. Shadaj | - Sa - Re - Ga - Ma - Pa - Dha Ni (Shadaj Gram) |
| 2. Arshabhi | - <u>Re Ga Ma Pa Dha Ni</u> Sa (Shadaj Gram) |
| 3. Dhaivati | - <u>Dha - Ni</u> Sa Re Ga Ma Pa (Shadaj Gram) |
| 4. Naishadi | - <u>Ni</u> Sa Re Ga Ma Pa Dha (Shadaj Gram) |
| 5. Gandhari | - <u>Ga Ma Pa Dha Ni</u> Sa Re (Shadaj Gram) |
| 6. Madhyama | - Ma Pa Dha Ni Sa Re Ga (Shadaj Gram) |
| 7. Panchama | - <u>P a Dha Ni</u> Sa Re Ga Ma (Shadaj Gram) |

It should be noted that the starting note of each of the Murchhana must be in Mandra Saptak, since it has been prescribed that the Nyas note of a Shuddha Jati must be in Mandra Saptak. However, Pandit Omkarnath Thakur has mentioned that this restriction is not so rigid and the Nyas note can be in Madhya Saptak also. All that is necessary is that it should not be in Tar Saptaka.

Vikrata Jatis

are those which deviate from some or all of the above rules except one. The Nyas note must be the same as the starting note of the Murchhana or Taana. A Vikrata Jati can be associated with a Shaadava or Oduva Taana instead of a complete Murchhana, its Graha, Ansha Apanyas notes can be different from the starting note of the Murchhana or Taana, but the Nyas note cannot be different. This way, 153 Vikrata Jatis have been enumerated by Ratnakar Kar.

We can now pass on to Ragas. The essential structure and concept is already built in Jatis which were the prototype of modern Ragas (*the word Raga has also been used by Bharat*).

A Raga comes from a Thata rather than from a Murchhana or Taana. We know that, in a Thata, starting note is always Sa while it could be any note in Murchhana (*it may be recalled that for deriving a Thata from a Murchhana, we called the starting note as Sa, renamed all other notes according and adjusted the entire scale in such a way that the new starting note coincided with the original Sa of the Murchhana*).

If we use a Thata as such (*allowing all the seven notes while ascending as well as while descending*) we get what are known as Sampoorna Ragas analogous to the Shuddha Jatis or Vikrata using a complete Murchhana. On the other hand, a note or a pair of note can be omitted from a Thata while ascending or descending or both ways. This gives rise to Shaadav or Oduva Ragas. At least five notes must be used by a Raga while ascending as well as while descending. The notes used while ascending is determined by what is called Aaroh of a Raga. An Aaroh can be Sampoorna (*using all the seven notes*), Shaadav (*omitting one note*) or Oduva (*omitting a pair of notes*).

For example in Bilawal Thata

Sa Re Ga Ma Pa Dha Ni Sa — is the Sampoorna Aaroh

Sa Ga Ma Pa Dha Ni Sa — is a Shaadav Aaroh and

Sa Ga Ma Pa Dha Ni Sa — is an Oduva Aaroh. १

Similarly, the notes used while descending are specified by the rule of Avaroh which, like Aaroh, can be Sampoorna Shaadav or Oduva.

Examples are

Sa Ni Dha Pa Ma Ga Re Sa (Sampoorna)

Sa Ni Dha Pa Ga Re Sa (Shaadavo)

Sa Dha Pa Ga Re Sa (Odava)

Regarding omission of notes or pairs of notes also there are certain restrictions. These will now be described with justifications.

1. Shadaj is never omitted.

In the system of Thatas Shadaj has the same importance as the Nyas note in a Jati. It was mentioned above that the Nyas note was the same as the starting note of a Murchhana or Taana in all Jatis - Shuddha or Vikrata. All other rules could be relaxed in Vikrata Jatis but not the rule about Nyas note. Since, in the system of Thatas, Shadaj is always the starting note, Shadaj becomes equivalent to the Nyas note for all the Ragas. Pandit Omkarnath Thakur has rightly interpreted the Nyas note as identical with the ~~f~~warit or tonic. Of course, Shadaj was defined to be the tonic right in the beginning. Hence, it is only natural that Shadaj should be never omitted in any Aaroh or Avaroh.

How can the tonic be absent from a Raga ?

Except Sa, any other note can be omitted in a Shadava Aaroh or Avaroh.

2. Both Madhyam and Pancham are not omitted in an Oduva Aaroh or Avaroh.

As a matter of fact in an Oduva Aaroh or Avaroh, two consecutive notes are seldom omitted. This rule is intended to avoid situations in which a pair of notes are omitted but all the note related to them by Shadaj Pancham, Shadaj Madhyam and one of the Shadaj Gandhar Bhavs are present. If this is allowed to happen, it may be a little awkward that although a pair of notes are absent, they are echoed through their close relatives. Hence, it is desirable that if a pair of notes is omitted, the pair must itself be related by one of the musical relationships (3/2, 4/3, 5/4 or 6/5) which means that two consecutive notes should not be omitted.

Hence, a Raga has a rule of Aaroh and a rule of Avaroh.

There are following possibilities :

- | | |
|----------------------------|---------------------------------------|
| 1. Sampoorana - Sampoorana | (Aaroh and Avaroh both Sampoorana) |
| 2. Sampoorana - Shadava | (Aaroh Sampoorana and Avaroh Shaadav) |
| 3. Sampoorana - Oduva | (Aaroh Sampoorana and Avaroh Oduva) |
| 4. Shadava - Sampoorana | (Aaroh Shaadav and Avaroh Sampoorana) |
| 5. Oduva - Sampoorana | (Aaroh Oduva and Avaroh Sampoorana) |
| 6. Shadava - Shadava | (Aaroh Shaadava and Avaroh Shaadava) |
| 7. Shaadava - Oduva | (Aaroh Shaadava and Avaroh Oduva) |
| 8. Oduva - Oduva | (Aaroh Oduva and Avaroh Oduva) |
| 9. Oduva - Shaadava | (Aaroh Oduva and Avaroh Shaadava) |

Considering the number of Ragas which can arise out of a given Thata only according to the rules of Aaroh and Avaroh,

it can be noted that :

1. There can be only one Sampoorana-Sampoorana Raga.
2. Since any of the six notes (except SA) can be omitted in Shaadav Aaroh or Avaroh, there can be six Sampoorana-Shaadava and six Shaadav-Sampoorana Ragas.
3. It follows from the above that there can be $6 \times 6 = 36$ Shaadav-Shaadav Ragas.
4. An Oduva Aaroh or Avaroh can be constructed in 15 ways since there are $6 \times 5/1 \times 2 = 15$ pairs from the six notes (*excluding Sa*). Hence there can be 15 Sampoorana-Oduva Ragas and 15 Oduva Sampoorana Ragas.
5. Since there can be 15 Oduva Aarohas and 15 Oduva Avarohas, there can be $15 \times 15 = 225$ Oduva-Oduva Ragas.
6. Finally, there can be $6 \times 15 = 90$ Shadava Oduva and 90 Oduva-Shadava Ragas.

Thus on the basis of the rule of Aaroh-Avaroh above there can be $1+6+6+36+15+15+225+90+90 = 484$
i.e. 484 Ragas arising out of a single Thata.

In the above calculation, the rule that both Madhyam and Pancham are not to be omitted in an Aaroh or Avaroh has not been taken into account. If this is also done, there can be only 14 Oduva Aarohas or Avarohas (*since one pair viz. Ma-Pa is not allowed to be omitted*) and the number of Ragas will be correspondingly less. However, Pandit Bhatkhande has mentioned the above number as the number of possible Ragas from a Thata on the basis of the rule of Aaroha and Avaroha alone.

Let us try to define a Raga in rigorous terms.

Pandit Vishrunarayan Bhatkhande has mentioned the following essential characteristics of a Raga.

1. A Raga comes from some Thata.
2. It must have a Vadi note and a Samvadi note.
3. A Raga must be melodious.
4. It must use at least five notes.
5. Both Madhyam and Pancham cannot be omitted in a Raga.
6. Both the varieties of a note (*Shuddha, Komal or Shuddha Teevra*) are not used in a Raga one after the other.

The above characteristics are certainly helpful in grasping the basic frame work of a Raga but they are neither exhaustive nor exact. The third one is rather difficult to define mathematically but most crucial while the last one is not observed strictly. In Lalit and Basant Ragas Shuddha and Teevra varieties of Madhyam are used one after the other quite often.

As we have already remarked, the essential characteristics of a Raga are the same as those of a Jati with the necessary modifications in view of the fact that in Ragas, we use the system of Thatas and Aarohas. Avaroh rather than the system of Murchhanas and Taanas used in Jatis.

The two concepts can be illustrated as follows :

Gram - Murchhana-Taana-Jati

Swara or notes

Thata - Aaroha and Avaroha - Raga

Consequently, we can now formally define a Raga as a framework within which several tunes can be composed subject to the following essential ingredients.

1. Ansha Swara

This has been explained in detail while discussing Jatis, the concept remains the same in the case of Ragas also.

2. Graha

This also is as explained earlier.

3+4. Tar and Mandra

Like Jatis, Raga also have their Tar and Mandra limits related to the Ansha Swara and the same rule is followed.

5+6. Nyas and Apanyas

Nyas note now becomes the *fwarit* or the tonic Sa. Since a Thata always starts from Sa as against a Murchhana which could start from any note, the rule of Nyas means in the present context, that all the musical constructions finally end on the Sa which is invariably the Nyas note now. The note Apanyas has the same meaning as in the case of Jatis.

7+8. Alpatva and Bahutva

These are notes which have Alpatva and Bahutva in Ragas as in Jatis. The difference between a note having Bahutva in a Raga and Ansha note has been clearly illustrated by Pandit Omkarnath Thakur by citing the example of Raga Yaman in which, according to him the Ansha Swaras are Re and Pa but Ga has Bahutva. If the Swaras Re and Pa are omitted, the form of the Raga Yaman gets totally distorted inspite of the frequent use of Ga. For example if the sequence Ni - Sa - Ga - Ma* - Ga - Ma* - Dha - Ma* - Ga - Sa or any other sequence is sung omitting Re and Pa altogether, the form of Yaman is totally lost. On the contrary, it is possible to construct a sequence committing Ga completely, but utilizing Re and Pa cleverly in which the characteristics of Yaman are clearly visible.

An example is

Ma* - Dha - Pa, Ma* Dha - Ni Re Sa, Ni - Re - Sa, Ma* - Dha - Ni Dha - Pa, Ma* - Dha - Pa, Ni - Re - Sa

Thus, although Ga Swara has Bahutva in Yaman, the form of the Raga depends mainly on the Ansha Swaras Re and Pa.

9+10. Shaadavatva and Oduvatva

Like a Jati, a Raga also may be Sampoorana, Shaadav and Oduva depending upon its rule of Aaroh and Avaroh as already explained. It also follows from the rule of Aaroh and Avaroh that a Raga cannot have less than five notes, and it must not omit Ma and Pa both in Aaroh or Avaroh.

11. The requirement that the Raga must be melodious

can be met by choosing the notes to be employed (*or to be omitted*) in Aaroh and Avaroh in such a way that maximum possible musical relationships are retained and made use of. In doing so, the frequencies of the notes also are adjusted so that the number of musical relationships are maximum. Some times, different frequencies (*Shrutis*) of the same note are used in different combinations. For instance, in Raga Malkauns, when the sequence Ma-Ni'-Dha-Ma is used, Ni' = 16/9 is used which combines musically with Ma (=4/3). But when the sequence Ni' - Ga, is sung, Ni = 9/5 is used, so that it combines musically with Ga' (=6/5).

The above ingredients are, by and large sufficient to define a Raga in a general way. Attempts can be, then, made to discover a variety of melodious constructions within the above frame work by experimenting with all the permissible permutations of the sequences of notes and also experimenting with the infinity of musical notes permissible. By varying the order of the notes, their loudness, quality, their mode of approach etc., infinite tunes are possible within each Raga. Yet, a Raga retains a mood of its own which is contributed by the above mentioned ingredients - especially its Ansha notes, the notes having Bahutva, Tar and Mandra Gati, its generating Thata and the Aaroh and Avaroh employed. Various tunes within the Raga only express this mood in a variety of ways. Often certain combinations are recognized as typical in a certain Raga because they express its mood very successfully. Such combinations are called "*Pakar*" of the Raga and it is a matter of requirement to make a frequent use of them.

It may be mentioned here that modern literature, recognizes a pair of notes for each Raga known as Vadi and Samvadi which are called the "*Main*" notes of the Raga. Vadi note is the most important in a Raga, and Samvadi is next only to Vadi in importance. Vadi and Sam Vadi are usually related by Shadaj Pancham or Shadaj Madhyam Bhav. It is not easy to relate the modern concept of Vadi and Samvadi with the ancient concepts of Ansha and notes having Bahutva and Alpatva, but it appears that Vadi and Samvadi notes are the same as Ansha notes, while the notes having Bahutva may or may not be the same as Vadi or Samvadi.

The above discussion of the definition of a Raga is too general. Apart from the above mentioned general ingredients, each Raga has a certain individuality - a certain personality.

A Raga is not just a mechanical aggregate of the above ingredients. It has its own characteristics also. Sometimes, a Raga makes use of a note which has to be very sparingly used, in a particular way only and yet imparts an important flavour to the Raga. Examples are not Ga' in Raga Jai Jai Vanti and Ma* in Bihag. In Jai Jai Vanti, Ga' is typically used as Re, Ga', Re, Sa or Ga' Re-Ga'-Re-Sa while Ma* in Bihag has to be used only as Pa-Ma*, Ga Ma Ga or Ma*, Pa, Ga, Ma, Ga. Both these notes are very sparingly used and only in the way described above, but it is almost impossible to imagine the Ragas without these notes. Every musician knows that the flavour of Jai Jai Vanti depends upon Ga' mainly and similarly Ma* imparts a typical flavour to Bihag. Notes like Ma* in Bihag are called Vivadi notes. If they are used more often or other wise than prescribed, the form of the Raga is distorted.

As a example of how the frequencies of the notes are adjusted for the sake of musical relationships or to make the Raga melodious, consider the Raga Miyan Ki Todi.

The notes of the Raga, according to the author are :

Sa, Re' (16/15), Ga' (32/27), Ma* (64/45), Pa(3/2), Dha' (8/5) Ni (48/25)

Sa-Pa, Re'-Dha' pairs have Shadaj Pancham Bhav

while pairs Ga'-Ni, Ma*-Sa, Pa-Re' and Dha'-Ga are not musically related.

Also, Ga'-Ma*, Dha'-Ni are related by Shadaj-Komal Gandhar Bhav while Dha'-Sa is related by Shadaj Shuddha Gandhar Bhav.

Apart from this Ma*-Dha' is related by Shadaj Shuddha Gandhar Bhav. Further, Ma*-Dha' is related by the ratio 9/8 which is an agreeable relationship. Pairs Sa-Ga' Re'-Ma*, Ga-Pa, Pa-Ni and Ni-Re are non musical.

Every musician knows that, although the Raga is Sampoorna-Sampoorna, Pa is almost always omitted in Aaroh also it is sparingly used (*In a closely resembling Raga Gujari Todi, Pa is omitted altogether*). Maximum use is made of the musical relations Dha'-Sa, Ga'-Ni while the nonmusical pairs are always avoided. Since Ga' does not combine musically with Sa, these two notes are never combined with each other. Ga' is often used in conjunction with Re' - by starting with Re' and then dragging it upto Ga' (Re' - Ga are related by ratio 10/9 - an agreeable one). The sequence Ga'-Ma* - Dha' - Ni-Dha' -Sa is often used in Aaroh in which each note is musically related to the previous one. Hence, out of a Thata which is poor in musical relationships, a melodious Raga has been constructed in such a way that non musical pairs are avoided and musical pairs have been cleverly picked up and emphasized. It will not do to mechanically employ all the combinations in this Raga only because it is a Sampoorna-Sampoorna Raga.

Let us take another example of how different Shrutis of the notes can be utilized to create a distinctive mood.

The notes of Raga Darbari Kanhada are :

Sa, Re (9/8), Ga' (243/200), Ma (27/20), Pa (3/2), Dha' (81/50) Ni' (9/5)

in which Ga' is 81/80 times higher than normal Ga' (6/5), Ma is 81/80 times higher than normal Ma (4/3), Dha' is 81/80 higher than normal Dha' (8/5). The scale, on the face of it looks very unmusical, but in the Raga, the notes are used in such typical combinations that all the unmusical pairs are cut out.

Also, Sa, Pa and Ni' are often elevated by 81/80 in certain combinations as explained below :

A typical Aaroh and Avaroh of the Raga is as follows

Sa, Re, Ga' Ma Pa, Dha' Ni' Sa ... (Aaroh)

Ni-Sa-Re-Sa, Dha'-Ni'-Ga', Ga'-Ma-Re-Sa (Avaroh)

In Aaroh, apparently, Ga' comes after Re (*with which it is not musically related*), but in fact in all such sequences as Re-Ga'-Ma Pa or Re-Ga'-Ma-Re-Sa, Ga' is approached in such a way that it echoes with Ma (*Ga' Ma is related by 10/9 - an agreeable ratio*). Sometimes, however, Ga' is just touched lightly in a sequence such as Ni' - Sa-Re-Ga'-Sa, but then Ga' (6/5) is used so that it combines well with Re and Sa.

However, whenever Ga' is emphasized, the sequence always goes higher up such as Re-Ga' Ma-Pa or Ga'-Ma-Re-Ga'-Sa, but then Ga' (243/200) is used in conjunction with Ma (27/20). It may be noted that the relation Re-Ma is musical (6/5 - *Shadaj Komal Gandhar Bhav*). Similarly, Dha' is always approached in such a way that it is related to Ni' although it may immediately follow Pa.

Ma does not combine with Sa, but it does not matter because Sa and Ma are never related to each other in the Raga. Usually Pa (3/2) is used, but when it is required to combine it with Ga', it becomes necessary to raise Pa by a ratio 81/80. In the sequence Ma-Pa -Ni'-Ga', both Pa and Ni' are raised by the ratio 81/80 so that these frequencies become 243/160 and 729/400 with respect to Sa respectively.

This way

$$\text{Ma} - \text{Pa} = 9/8$$

$$\text{Pa} - \text{Ni}' = 6/5$$

$$\text{Ni} - \text{Ga}' = 3/2$$

All musical relationships.

Similarly, in another very typical sequence of Raga Darbari Ni-Sa-Re-Sa-Dha'-Ni-Pa.

Sa is raised by ratio 81/80 at both the places while other notes are in this usual places (Ni'=9/5, Re=9/4, Dha'=81/50 Pa=3/2) so that the successive relations are :

$$\text{Ni}' - \text{Sa} = 9/8$$

$$\text{Sa} - \text{Re} = 10/9$$

$$\text{Sa} - \text{Dha}' = 5/4$$

$$\text{Dha}' - \text{Ni} = 10/9$$

$$\text{Ni} - \text{Pa} = 6/5$$

All musical relationships.

A number of new Ragas can be invented by making use of the new Grams and Thatas developed in the preceding Chapter.

As an example, let us consider the Thata (*mentioned earlier*) which is the Dhaivat Murchhana of the Gandhar Gram (*as conjectured by the author*).

This Thata is :

Sa	Re	Ga	Ma*	Dha	Ni	Pa	Sa
1	9/8	5/4	25/18	3/2	5/3	9/5	2

$$\begin{aligned} \text{Sa} - \text{Pa} &= \text{Pa} - \text{Re} = \text{Dha} - \text{Ga} = 3/2 \\ \text{Sa} - \text{Ga} &= \text{Ni}' - \text{Re} = 5/4 \\ \text{Ga} - \text{Pa} &= \text{Ma}^* - \text{Dha} = \text{Pa} - \text{Ni}' = \text{Dha} - \text{Sa} = 6/5 \\ \text{Sa} - \text{Re} &= 9/8 \\ \text{Re} - \text{Ga} &= \text{Ga} - \text{Ma}^* = \text{Pa} - \text{Dha} = \text{Ni} - \text{Sa} = 10/9 \end{aligned}$$

Hence, in order to construct a Raga, we must choose Aaroha Avaroha in such a way as to avoid unmusical and awkward relationships. While singing also, combinations which are the unmusical related notes should be avoided.

Aaroha Sa - Re - Ga - Ma* - Dha - Sa
Avaroha Sa - Ni' - Pa - Ga - Re - Sa

Aaroha Sa - Re - Ga - Ma* - Dha - Sa
Avaroha Sa - Ni' - Pa - Ga - Re - Sa

Vadi - Ga)
Samvadi - Dha) related by Shadaj-Madhyam Bhav

Ansha Swaras - Ga and Dha
Bahutva Graha - Ga
Alpatva (Vadi Swara) - Ma*
Category - Oduva - Oduva

Pakar - or typical characteristic -
Ga - Ma* - Dha - Pa, Ni' - Pa - Ga, Rc - Ga - Ma* - Ga - Rc
Sa - Re - Ga - Re - Ga
Range - Mandra and Madhya Saptak.

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In a similar fashion, many other Ragas can be constructed from the Thatas mentioned in the preceding Chapter - particular the new Thatas which are not yet explored. The essential point, while constructing the Ragas from a Thata should be to take care of its being melodious first. This can be done by selecting Aaroh and Avaroh in such a way that the musically related notes are picked up and the unrelated notes are discarded. The other ingredients and conditions can then be selected suitably according to a general expectation of how the Raga is likely to develop and which notes can impart it a special flavour. A detailed description of the popular Ragas which have been well developed by the great musicians is not being given here. This is readily available in various textbooks.

A word of caution regarding the condition of being melodious and the musical relationships. So far, it has been emphasized that the musically related notes (*in the sense understood so far*) are responsible for the melodious effect. This follows from the scientific theory and is by and large true in the world of music. But, there are exceptions. There are notes which are employed in certain Ragas repeatedly in combination although they are not musically related. A glaring example is in Raga Shri in which Re' and Pa are used in combination very frequently (*in fact this combination is a characteristic feature of the Raga*) but Re, and Pa can never be musically related. The Pa used is the normal one $3/2$ times higher than Sa. Whatever frequency we assign to Re' it cannot be musically related to Pa. The human ears seem to have developed a taste for such "*Strange relationships*" also.

It has been said earlier that apart from the general rules and ingredients, a Raga has an individuality - a personality of its own. Some time a certain note has to be employed in a certain typical way only which is difficult to define but easy to demonstrate. As an example, in Raga Jai Jai Vanti, in the Alankar (*combination of notes*). Ni Sa Dha Ni Re, Re is employed in a very typical fashion like a stroke which goes right up to Ma before descending down and settling on Re. In Raga Alhayya Bilawal, every note in Aaroh is vibrated in its neighbourhood. Some times, a note is to be employed very softly in a Raga, sometimes in a resounding way. Some times notes are touched in a straightforward way and sometimes in a continuous and smooth sweep (*called Meenda technically*). Sometimes the notes are used in strong vibrational strokes called "Gamakas". There are many characteristics that various Ragas have pertaining to the manner in which the notes are employed. Some are said to have a serious mood and some are swift and naughty (*Chapala*). Some are straightforward like Jhinjhoti and some are twisted or crooked (*Vakra*) like Tilak Kamod. Most of these characteristics or "*personality traits*" are difficult to define in scientific terms.

To sum up the discussion of Ragas, a Raga is a framework of notes arising out of a Thata, bound by a set of rules which are essentially in the nature of certain conditions or restrictions having a lot of scope for composition of tunes. However, apart from the general set of rules, a Raga has its own special characteristics also which are difficult to define but easy to demonstrate. In order to construct a Raga from a Thata, an important step is to select Aaroh and Avaroh in such a way that maximum number of musical relationships are exploited.

This would take care of an important requirement that a Raga must be melodious. Although there are also exceptions to the rule that only musically related notes are regarded as melodious within a Raga, in general, it is possible to have infinite Alankar or groups of notes that can be sung or played.