

Gramantara

(Translating *Shadja Grama* into *Madhyama Grama* and vice-versa)

By Dr. Vinod Vidwans

Any scientific treatise is always consistent in its description of theoretical concepts. Bharata Muni's *Shruti-Nidarshanam* experiment conclusively proves that Bharata's 22 *shrutis* were of equal temperament. Bharata Muni also provides another very important experiment called *Dwi-Vidha Moorchchhana Siddhi*. This experiment also supports that Bharata's 22 *shrutis* were of equal temperament. It means that there exists consistency across various sections of Bharata Muni's *Natyashastra*.

Bharata Muni provides a method to translate '*Moorchchhanas*' of one *Grama* into the '*Moorchchhanas*' of the other *Grama*. Especially it is easy to do so on a *Veena*. *Moorchchhana* is an ordered sequence of *swaras* in a *Grama*/ *Saptaka*. *Grama* is a group of select *swaras* from the *Saptaka*. *Shadja Grama* and *Madhyama Grama* were two well established *Gramas* during Bharata Muni's times. Accordingly, he says that in the case of a *Shadja Grama*, the *dvi-shruti Gandhara* needs to be raised to the state of '*Antar Gandhara*' by tuning into *Dhaivata swara*. So instead of '*dvi-shruti Gandhara*' the new *Gandhara* will be of four *shrutis*. With this change the *Shadja Grama* is converted into *Madhyama Grama* and therefore the *Moorchchhanas* of earlier *Shadja Grama* will be translated into the appropriate *Moorchchhanas* of a *Madhyama Grama*. As a result of this transition, names of the *swaras* will change and so *Shadja* will become *Madhyama*, *Rishabha* will become *Panchama* of *Madhyama Grama*, *Antar Gandhara* will become *Dhaivata* of *Madhyama Grama*, *Madhyama* will become *Nishada* of *Madhyama Grama*, *Panchama* will become *Shadja* of *Madhyama Grama*, *Dhaivata* will become *Rishabha* of *Madhyama Grama*, and finally *Nishada* will become *Gandhara* of *Madhyama Grama* respectively. Thus, the *Shadja Grama* is converted into *Madhyama Grama*.

Similarly, in the *Madhyama Grama* if *Dhaivata* is reduced by two *shrutis* the whole *Madhyama Grama* is converted into a *Shadja Grama* and thus all the *Moorchchhanas* of *Madhyama Grama* will be translated into the *Moorchchhanas* of *Shadja Grama*. As a result, all the *swaras* of a *Madhyama Grama* such as *Madhyama*, *Panchama*, new *Dhaivata*, *Nishada*, *Shadja*, *Rishabha*, and *Gandhara* will be redefined as the *swaras* of *Shadja Grama* as *Shadja*, *Rishabha*, *Gandhara*, *Madhyama*, *Panchama*, *Dhaivata*, and *Nishada* of *Shadja Grama* respectively. With just one change with the *Dhaivata swara*, the *Madhyama Grama* changes to *Shadja Grama*.

This happens because the relative distances among *shrutis* are preserved. In a *Madhyama Grama* the distance between *Panchama* and *Dhaivata* is of four *shrutis*. When *Dhaivata* is reduced by two *shrutis*, this new *Dhaivata* becomes the *dvi-shruti Gandhara* of a *Shadja Grama*. In the previous case of *Shadja Grama* when *dvi-shruti Gandhara* is raised by two *shrutis* it becomes four *shrutis Gandhara* and is translated or assumed as the four *shruti Dhaivata* of the *Madhyama Grama*. Other remaining *swaras* are mapped respectively because

they have the equivalent *shruti* distances. Abhinava Gupta elaborates this phenomenon in his *Abhinava Bharati* as follows.

अत्र वैणिकस्योपदेशार्थमाह द्विविधैकमूर्च्छनायाः षड्जग्रामिक्या द्विविधाया मध्यम ग्रामिक्यो द्वितीयेन प्रकारेण युक्ताया यथासिद्धिर्भवति तथोच्यते|...

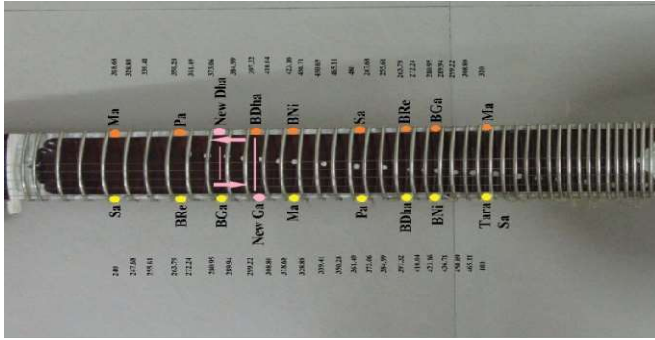
... अत्र हेतुमाह तुल्यश्रुत्यन्तरत्वादिति| संज्ञान्यत्वमित्यनेन प्रयत्नान्तरमत्र न किञ्चिदितिदर्शयति| संज्ञान्तर स्वरे ग्रामे मूर्च्छनायाश्च तुल्यश्रुत्यन्तरत्वं स्पष्टयति अन्तरनिर्दानमपीति| अपि शब्दाद्वक्तव्यमपि सदित्यर्थः| श्रुतिनिर्दानमिति| द्वे वीणे इत्यत्रैव मूर्च्छनानाम् पूर्णावस्थोक्ता|

[Kavi, M. Ramakrishna and Pade, J. S., (Ed.), 1964, p-26]

While commenting on the description from Bharata Muni's *Natyashastra*, Abhinava Gupta points out that Bharata Muni's description of *Dwi-Vidha Moororchchhana Siddhi* is very useful for *Veena* players. Further he comments that it's a strange and equally amazing phenomenon that raising or decreasing just one *swara* has such an impact that one *Grama* is changed into another. This happens because *shruti* distances between the respective *swaras* of one *Grama* are *equivalent* with *swaras* of another *Grama*. With just one change the names of *Gramas*, the names of the *swaras* and the names of *Moororchchhanas* change effortlessly. In the process the '*Antar Gandhara*' *swara* is also recognized with clarity and *shrutis* are demonstrated in a definite way. This method has close correlation with the '*Chatuh Sarana*' experiment. Since '*Taanas*' are based on *Moororchchhanas*, this *Grama* transformation method comes very handy for *Veena* players while performing.

This provides very strong evidence for the fact that Bharata Muni's twenty-two *shrutis* were of equal distance or were of equal temperament. The above-mentioned method of translating one *Grama* to another will not yield the results unless the *shrutis* are of equal temperament. The literature on *shruti* research suggests that there are many proposals for non-equal temperament twenty-two *shrutis*. However, theoretically as well as practically none of them will succeed in satisfying the description of '*Dwi-Vidha Moororchchhana Siddhi*'. For any unequal temperament proposals, the method will fail. The *swaras* and *shrutis* of one *Grama* will not be translated into the *swaras* and *shrutis* of another *Grama*. In some cases, the *swaras* may be mapped but their internal *shrutis* of the specific *Moororchchhanas* will not be mapped. Internal ratios of respective *shruti*-pairs will not be mapped. In some cases, even the *swaras* will not map. In general, for any non-equal temperament *shruti* proposal, there will be at least two *swaras* along with their *shrutis* of the initial *Grama* that will not be mapped on the desired *swaras* and the *shrutis* of the newly translated/ formed *Grama*. This method is important because it provides a mechanism to convert *Shadja Grama* into the *Madhyama Grama* or vice versa. Apart from that this '*Dwi-Vidha Moororchchhana Siddhi*' method also provides another conclusive evidence for equal-temperament twenty-two *shrutis* of Bharata Muni.

Following diagram provides a graphical description of this experiment for the reference. One can see how *Gramas* are translated in the experiment. The textual description of the experiment is already provided in above paragraphs. Following diagram is for equal temperament *shrutis*.

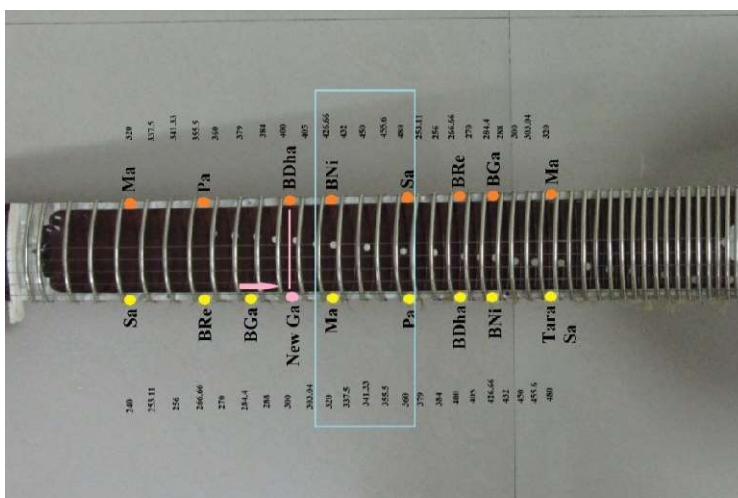


In the above description, Bharata Muni provides a method to translate 'Moorchchhanas' of one Grama into the 'Moorchchhanas' of the other Grama. Especially it is easy to do so on a *Veena*. Accordingly, he says that in the case of a *Shadja Grama*, the *dvi-shruti Gandhara* needs to be raised to the state of 'Antar Gandhara' by tuning into *Dhaivata swara*. So instead of *dvi-shruti Gandhara* the new *Gandhara* will be of four *shrutis*.

With this change the *Shadja Grama* is converted into *Madhyama Grama* and therefore the *Moorchchhanas* of earlier *Shadja Grama* will be translated into the appropriate *Moorchchhanas* of a *Madhyama Grama*. Other remaining *swaras* are mapped respectively because they have the equivalent *shruti* distances.

Similarly, in the *Madhyama Grama* if *Dhaivata* is reduced by two *shrutis* the whole *Madhyama Grama* is converted into a *Shadja Grama* and thus all the *Moorchchhanas* of *Madhyama Grama* will be translated into the *Moorchchhanas* of *Shadja Grama*. With just one change with the *Dhaivata swara*, the *Madhyama Grama* changes to *Shadja Grama*.

However, in the case of un-equal temperament *shrutis*, as shown in the marked area in the following diagram, the *shruti* distances between *Madhyama* and *Panchama* of *Shadja Grama* and Bharata Muni's *Nishada* & *Tara Shadja* of *Madhyama Grama* do not match appropriately.



Thus, it conclusively proves that Bharata Muni's twenty-two *shrutis* were of equal temperament because otherwise the *Dwi-Vidha Moorchchhana Siddhi* experiment will not succeed.