

**Appreciating Carnatic Music**  
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**Lecture - 12**  
**Sruti in Sanskrit Textual Tradition**

The word sruti is, fairly common in contemporary carnatic music. In casual furlongs, the word sruti means the pitch, the fundamental, the tonic at the person with which the person performs. So, for instance my tonic is G or G sharp, that is my sruti, I will say my sruti is five, that is fifth white key.

But in the tradition, itself in Lakshna Grantha tradition, this meaning came on much later. The more ancient meaning of sruti refers to, smaller pitch intervals between swaras. When we were looking at the twelve swarasthanas in an earlier session.

(Singing Starts: 01:30) (Singing Ends: 01:35) sa ri, the next pitch, the swarasthana after sa (Singing Starts: 01:41) (Singing Ends: 01:43), we saw that, it is next pitch, when we also mention in, we also saw that, we can actually discern pitches between this two. (Singing Starts: 01:53) (Singing Ends: 02:01) On this pitch, is not yet at ri one

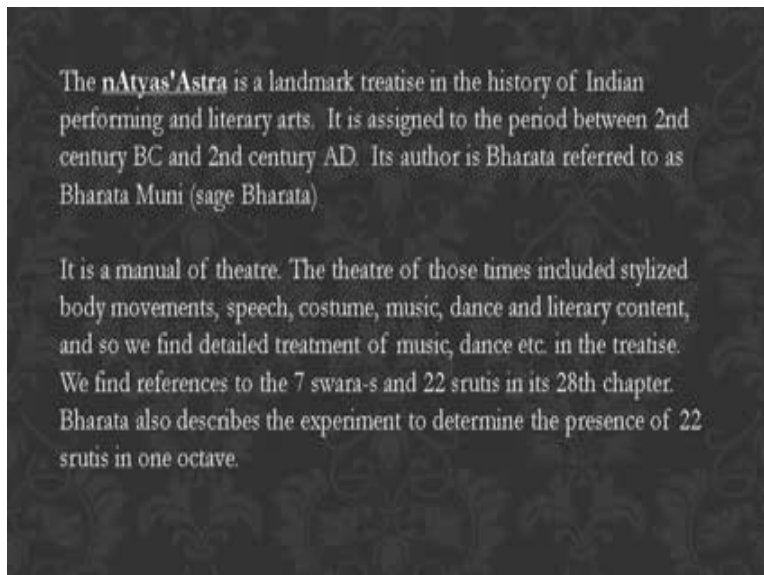
So, there are smaller interval between twelve swarasthanas, that we know. Theoretical of course, they are infinite, but even between human discernment, any normal human ear can discern, more minute differences than these twelve swarasthanas.

Now these are called sruti. But it is interesting, that a number of such that, this smaller interval, that numbers has been given in the traditions. Theoretically infinite pitches are possible but in actual, within the range of human discernment, how many are there, in there was a number given in tradition and that is twenty-two.

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So we speak of twenty two srutis in one sthayi. There are seven swaras, twelve swarasthanas and twenty two srutis. How was these numbers arrived at? It was arrived at empirically, an experiment was conducted two thousand years ago, and a description of this experiment found in natya sastra of Bharata Muni. This natya sastra is quite a remarkable work. It is landmark treaties in the history of Indian performing and literary art.

It is left deep impact on the on the dance, music and literary forms of India. In itself natiya sastra is a concern itself in theater, natya mean theater. Where it is not theater today, which is dialog dominated, it is dominated by dialog.

Today's theater is dialog based. Whereas, ancient theater, whether of India or even of Greece. There were many aspects to theater, dialog was only one part, besides stylized bodily movement, were part of theater, music was part of theater, dance and costumes themselves heavily stylized costumes.

So, all this went to invent into the making of production of theater. Natya sastra is manual of theater, how do you produce a successful play? That is what is the concern of natya sasatra. But there is much more in it, than just rules and instruction. The seminal theory of rasa. All Indians, all of us heard of navarasas, original concept of this rasa is in natya sastra.

The twentieth chapter of natya sastra concerns itself with music and it is in this chapter, twenty-eight. In the twenty-eight chapter, we find description of this experiment, I just spoke of on the basis of which Bharata Muni suggested, propounded twenty-two sruti in sthayi.

So, what was the experiment like. It was very simple, really, he took two veenas and the veena of those times, was not like our veena. It was more like harp, there were no frets, there were many strings, each string tuned to a certain pitch.

So, what he did was, when the these two veenas, one of them was a aachala veena, that is he wouldn't tampered with the strings. String were tuned and tampered.

The other was the chala veena, where the pitch could be adjusted. tuned higher or lower. A very simple process, he started off with a pa. panchama swara and by lowering the pitch of the panchama. step by step, lowered it just little, so that you able to discern. So, that is slightly lower pitch, this is slightly, more lower pitch, and so on. He arrived at; he calculated how many times he has to lower the pitch, to arrive at the ma of the aachala veena.

And this way, he went on through the octave and he arrived at the number twenty-two. Now this number twenty-two srutis, has not been contested in the traditions, everybody accepts that there are twenty-two srutis. Interestingly, I have found references to, experiment conducted in more modern times.

AJLS, conducted an experiment, similar calculation on really, it not on instrument based, the calculation is that, the ratio between any two pitches that a separated by least discernable difference. That is a certain ratio, given that ratio he calculated, that there will be so many more tones in a octave and that number also comes very close to twenty-two.

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So, what that the word sruti mean then, srUyate its sruti. It can be heard, what that which can be heard sruti and in this sense actually the word sruti, probably means an interval. It is this interval difference can be heard. Difference between two pitches can be heard, that is a sruti. Sa re between these two there are two or three pitches can be heard. And that is the, those are srutis, so sruti even within the traditions, at it some text talk of it as interval between pitches, other text talk of it as the micro tones themselves.

But in any case, the tradition treats srutis with great diligence. And in modern carnatic music, many musicologist feel that the concept of sruti is not relevant. The concept of twenty-two srutis certainly, is perhaps not relevant, that is because music of bharata time or even in the sangeeta ratnakara time, it is it is very different in the kind of music that we know today.

So, the twenty-two srutis was propounded in the context of that music. And today, it has, it does not have the same relevance certainly. But it is also fact that simply as an idea it fascinates many minds, especially those with mathematical bent. There are many musicians or many aficionado or listeners of carnatic music with mathematic bent. They have tried to figure out the ratios between the twenty-two srutis

It is certainly, an idea people are not willing to let go easily and even terms of actual practice. That is not entirely irrelevant, the number may irrelevant, twenty-two srutis may be irrelevant. But the fact that. there are micro tonal inflexions in carnatic music and that sense sruti is relevant.

Let me demonstrate, (Singing Starts: 11:24) (Singing Ends: 11:30) So swara is just this. (Singing Starts: 11:33) (Singing Ends: 11:39). But in such in raga, this ri will be nuanced in a different way (Singing Starts: 11:45) (Singing Ends: 11:47) which is not ri, is not that. (Singing Starts: 11:52) (Singing Ends: 11:58) It doesn't quite, reach that pitch positions its lower and carnatic music is filled with these other positions between the swarasthanas.

They are excited, these pitches are used constantly, in that sense sruti is not relevant. Though certainly yes, the context in which the concept of sruti is propound that no longer obtain, the original context in which the idea of twenty-two srutis was propounded, that music was certainly very different from today's music.

But in as an idea, that it is micro tones, we are talking about, small inflexions between swarasthanas, that I used in the music in that sense, sruti is very much still relevant.