Appreciating Carnatic Music
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Lecture 66
Mridangam

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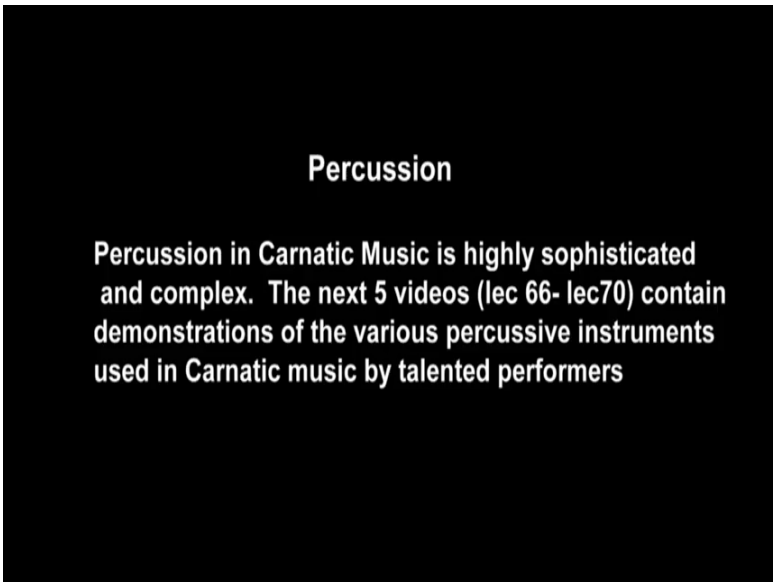

Welcome to this lecdem – a presentation of South Indian Carnatic percussion instruments - Mridangam, Kanjira, Ghatam and the Morsing. I have three very good friends of mine and fabulous percussionists on stage, who will be the presenting the lecdem and also be playing the respective instruments along with me. To my right is Vidwan Tanjavur Praveen Kumar, a brilliant Mridangist. He will talk about his, mention about his guru.

I started learning mridangam from Nallai Sri A.Balaji Sir. I learnt from him for 3 years and then I started learning mridangam again, from Guruvayur Sri Durai Sir. I have been under his tutelage for the past 14 -15 years and that is about my guru.

To my left is vidwan Sri H. Prasanna, a versatile musician: he is not only is a percussionist, he is a very good vocalist. It is said that a vocalist needs to know about the percussion instruments. And in the same way, whoever is playing percussion, they also need to know about the vocal music aspects and he has trained himself intensely in vocal music and he will mention about his gurus.

Sri Gurobiyo Namaha! I am basically a product of Kalakshetra, I did my part time certificate course in vocal under under professor D. Pashupati and I also learnt mirdangam under

Palakkad P.K. Ranganathan. Since 2001 I have been specialising in Ghatam under Ghatam Sri.V. Suresh, Thank you.

On the Morsing we have a very senior Vidwan, Kalaimamani Sri A.S. Krishnan sir - he will mention about his gurus. First I learnt with my father, Sri A.K.Sundaram sir and then advanced training taken from Mannarkudi A. Easwaran and also learnt mridangam also with Melakaveri Krishnamurthy Sir and then Thanjavur Kumar Sir.

And I am B.S. Purushotham and I am a disciple of Bangalore Sri M. L. Veerabhadrayya who was one of the senior most disciple of Sri Palakkad Mani Iyer - first set of disciples - and later I continued with his son, Bangalore Sri B. Praveen. I have learnt mridangam for over 16 years and also started playing Kanjira and then after shifting to Madras, from Chennai I am learning from Sangeetha Kalanidhi Dr. T.K. Murthy sir and I am specialising in Kanjira. Thank you.

We now start our lecdem with Praveen Kumar playing on the mridangam and he will talk about the construction and other aspects of mridangam and also tell about the basics of the learning process of mridangam.

Mridangam as an instrument, as I see it, incorporates three divisions of science basically which is quite surprising for a lay man because it is just a guy tapping on a drum. But if you get into the science behind the instrument it takes three divisions of science, which is Maths, Physics and Chemistry. When I talk about Physics, it is the constructional details and the craftsmanship that goes behind constructing the instrument. So, let me just start to explain the various parts of the instrument.

So, mridangam is basically a double headed instrument.

This is the right head and this one is the left head. So, the right head has three layers of skin or leather and they are not the same type of leather: it has buffalo skin, it has cow skin and it has goat skin. So the region around this black area is basically cow skin, which is not too fragile or not too sturdy, which is bit of mixed tonal quality. And the skin that is below this black region is the goat skin which is kind of fragile and has some adhesive property and hence it has been chosen. And the skin or the leather you are seeing here is the buffalo skin, so that is about the right head. I will come to this black region when I talk about the chemistry part of it.

So, when you look at the left head of the instrument, it has two layers of skin, this one is a very hard layer this does not produce any sound or we do not use it for playing just support for this or it is mounted on this.

And the layer inside has cow skin which gives the open tone. And when you talk about the body of the instrument, it is mainly made of jackfruit wood, this one here. It is because, it is very sturdy, it has a very high tensile strength and my mridangam makers have told me that the diameter of the mouth on the both ends does not change over a period of time whereas the other woods or other materials change. So, that is the reason why Jackfruit wood is preferred.

And these two heads are laced upon by a layer of leather again. This is a new invention that is probably taken like 10 years back. This is basically a parachute material that has been used which has very high tensile strength and could actually hold these two heads tightly. But actual leather that is used for this is again, buffalo's skin, again it is highly rigid and it has very high tensile strength.

So, that is about the basic parts of the mridangam. So, now we move into the sound production of the instrument which is also science.

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So, Professor Sir C.V. Raman has actually done a paper and early 1930's.

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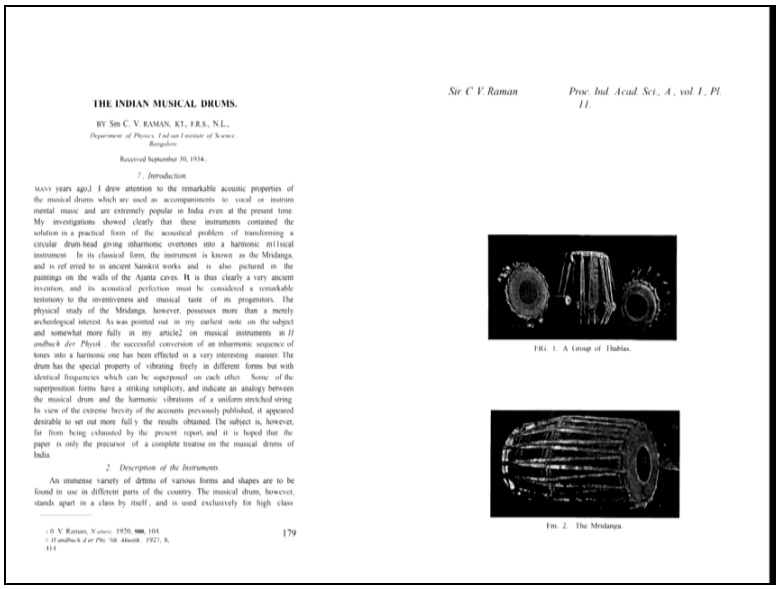

THE INDIAN MUSICAL DRUMS.

BY Sir C. V. RAMAN, KT., F.R.S., N.L.,

Department of Physics, Indian Institute of Science, Bangalore

Received September 30, 1934.

1. Introduction.

MANY years ago,1 I drew attention to the remarkable acoustic properties of the musical drums which are used as accompaniments to vocal or instrumental music and are extremely popular in India even at the present time. My investigations showed clearly that these instruments contained the solution in a practical form of the acoustical problem of transforming a circular drum-head giving inharmonic overtones into a harmonic musical instrument. In its classical form, the instrument is known as the Mridanga, and is referred to in ancient Sanskrit works and is also pictured in the paintings on the walls of the Ajanta caves. It is thus clearly a very ancient invention, and its acoustical perfection must be considered a remarkable testimony to the inventiveness and musical taste of its progenitors. The physical study of the Mridanga, however, possesses more than a merely archeological interest. As was pointed out in my earliest note on the subject and somewhat more fully in my article2 on musical instruments in *Handbuch der Physik*, the successful conversion of an inharmonic sequence of tones into a harmonic one has been effected in a very interesting manner. The drum has the special property of vibrating freely in different forms but with identical frequencies which can be superposed on each other. Some of the superposition forms have a striking simplicity, and indicate an analogy between the musical drum and the harmonic vibrations of a uniform stretched string. In view of the extreme brevity of the accounts previously published, it appeared desirable to set out more fully the results obtained. The subject is, however, far from being exhausted by the present report, and it is hoped that the paper is only the precursor of a complete treatise on the musical drums of India.

2. Description of the Instruments.

An immense variety of drums of various forms and shapes are to be found in use in different parts of the country. The musical drum, however, stands apart in a class by itself, and is used exclusively for high class

1 C. V. Raman, *Nature*, 1920, **105**, 501.
2 *Handbuch der Phy.*, Ak. Akustik, 1927, 8, 414.

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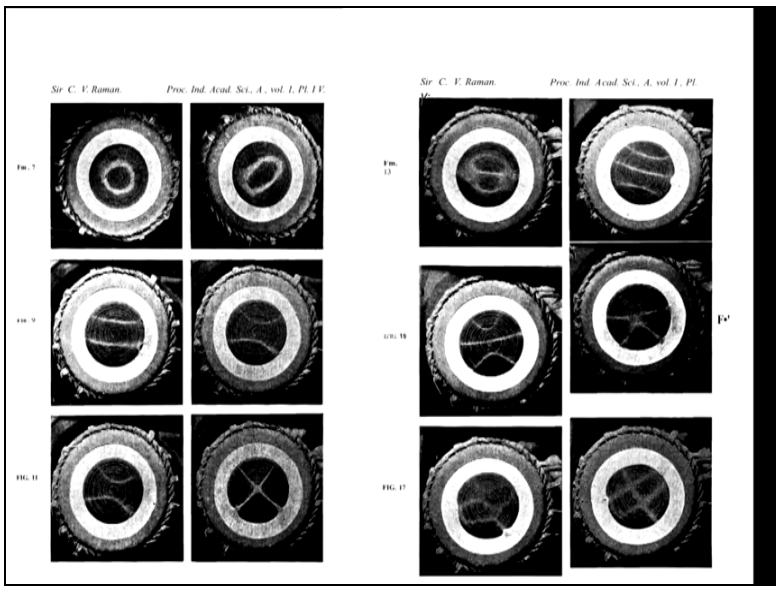
Sir C. V. Raman *Proc. Ind. Acad. Sci., A, vol. 1, Pl. 11.*

FIG. 1. A Group of Thablas.

FIG. 2. The Mridanga.



Sir C. V. Raman. *Proc. Ind. Acad. Sci., A, vol. 1, Pl. IV.*

FIG. 7

FIG. 9

FIG. 11

Sir C. V. Raman. *Proc. Ind. Acad. Sci., A, vol. 1, Pl.*

FIG. 13

FIG. 15

FIG. 17

And he has taken Tabla and Mridangam and he compared with the other global instruments that was prevailing at that period of time. So, mridangam is very special because it has a wide spectrum of sounds that can be produced starting from the treble to the bass. When I say treble you can correlate sounds like this **(Musical demonstration Start Time: 07:27)** And when I say bass you can correlate sounds like this. **(Musical demonstration Start Time: 07:31)** And there is mids as well which goes like; **(Musical demonstration Start Time: 07:36)**

And this particular tone that is produced here is tuned to that box right there which is Tanpura and that is probably the median that keeps musicians you know in line. So, there is a bit of tuning also involved, the tuning is very simple; you just take a rubber band and you stretch it

the more you stretch out, the tension is more, and the pitch more. So it is the same concept right here.

You had a rubber band there and you have buffalo skin or a parachute material here, so the more I pull it, tension is more, frequency is more and the pitch is more and it is also related to oscillations which is again sound production. And I use this particular stone, I give more tension again - the pitch increases. So, basically this mouth extends when I hit it here and when I hit it from the other side the reverse process happens. The tension reduces and pitch reduces. The same thing can be done on this side and the same physics goes behind that. That is about the basics of the Physics that is involved in the mridangam.

C.V. Raman Sir has gone into the over harmonics and overtones produced in the instrument where he says if I play this, the whole of the skin vibrates and there is no nodal lines. When I play this, one nodal line. When I play this there are two nodal lines and when I play with this there are three nodal lines. So, when play this it has four nodal lines – so that is about the crux of the Physics involved into the mridangam.

Now getting into the small bit of chemistry that is involved in mridangam, you see this black region that is stuck in the centre part of the mridangam. This is actually a combination of iron oxide, manganese and rice.

But the funny fact is that they do not produce iron oxide, manganese and other raw materials - they basically get it from a stone which has those contents and then the grind it and then they mix it with rice, the normal boiled rice and then they just you know stick on to this. Rice is basically for the adhesive properties. That is about the chemistry part of the mridangam.

Metallic sound - more of iron oxide and the manganese content is also you know... you get the stones in the northern part of India as well but they say it is not suitable for mridangam. May be suitable for tabla and dholaki or instruments like that because they use the same concept. So the way it is done is layer by layer. Yes it is done layer by layer, the stone is powered and mixed with rice, yes and then they do it by layer by layer. Like gum yeah.

So, that is how it is struck firmly and that is how it is....

about the left head.

The left head of the instrument, thanks for reminding me, we normally use rava which is sooji or I do not the other name semolina ... rava, exactly, thank you. So, that is used for the left head to get the bass of the instrument. This is again the invention that is been there for the past five or six years. We use something called plumbers putty or the dough, that you get ...I don't think you get it India. It is like, quite common in the US, so which gives the actual base te needed for the drum and you do not need any time to set your instruments, it is like ready

in 50 seconds. So, that gives the bass - without this it is very shrill and just like any other drum, Snare drum, Tom whatever you find. So, this particular paste is used as a dampener kind of a thing. So that is about Physics and Chemistry of mridangam. I will just play a short ....

There are four basic syllables in mridangam and they are Tha, Thi Thom Num. That itself explores the sound spectrum of the instrument. When I say Tha, it is is a very damp tone and it is, it has too much of highs in it. When I say The again a very sharp tone, when I say Thom this a very open tone and it has a lot of bases, when I say num it has some kind of something related to the Shruti - it has ... you hear that harmonic. So, it kind of explores that. So, the basic lessons are:

(Musical Demonstration Begins: 12:31)

So, this is probably the most common exercise that is being taught even now and probably Apart from this also you know while learning further, could you please play Chaapu and yeah and what all can be played on the right and also?

The Gumki part and I forgot to mention about the Gumki as well. Gumki is an extra stroke that you get in the left head other than the bass and the chaap, you have something where you can modulate the frequency after producing the bass.

So, it probably shows that it is very, very difficult not that easy to look at, very pleasing and one of the most toughest to play.

I can just show it you, it is actually a simple process, where I played open and then I tried to modulate it, like that.

And it takes practice years of practice of course everything take years of practice but this is one of the most toughest definitely. Those who have learnt the instrument they will know ... one of the most beautiful; yeah,

First when I was taught Gumki it was a circular motion that I was practicing, this was actually actual Gumki that I was taught. And then when I am playing the faster groove or something like that; came into that point. So I will just play a small, it is called sarvalaghu in carnatic music where we play groove and then we tried to add certain things to it, so;

(Musical Demonstration Begins: 14:26)

So, thanks Praveen, thank you, I have to mention that his Guru Guruvayur Durai sir and lineage he comes from Palani Sundaram Pillai stalwarts in playing mridangam itself but specialised in playing toppi that is call the left side, they are masters and you can listen to

their just left side of the toppi for hours and hours that is the kind of artistry they all had, thanks Praveen, that was a nice presentation on mridangam.

Was a pleasure thanks.