

427

THE FLUTE

A STUDY

*Containing a short account of its History, Antiquity and
Laws together with Full Instructions for
Practice.*

WITH TABLES AND ILLUSTRATIONS

P. SAMBAMOORTHY, B.A., B.L.



PUBLISHED BY
THE INDIAN MUSIC PUBLISHING HOUSE,
G. T., MADRAS.

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1937
THE
WITH TABLE
P. SAMBAMURTHI
Knowledge of Music

conduces to eternal bliss "

—Thyagaraja Swami

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FOREWORD

I am glad to write, at the request of the author, a foreword for this little book on the flute. The flute is not only one of the most distinctive instruments of India's musical genius but it is one of the most universal instruments in the world and this book will help us to understand some of the reasons for that universality. In India it is closely associated with one of the most popular gods of the Hindu pantheon, but long before that it was associated with the ubiquitous shepherd, perhaps the most ancient of all occupations. Many a time have I listened to the watcher by the flocks at night or in the late afternoon as he played the simple melodies on his homely flute. The flute is so homely, so suited to the genius of a homely people like the Indians. No doubt the flutist in these days is not content with the homely flock melodies of the boys in the fields, but still these are wedded to the flute and always we shall think of them together. A simple, inexpensive piece of bamboo and a little practice, together with some native art, and the heart is ravished by the quite simple beauty of the music. This is what gives the flute such a

charm to us all and makes us eager to know all that we can about it.

This little book, written by one who is a fine flutist himself, will help many to understand some of the mysteries of this simple and beautiful instrument and I can heartily commend it to all readers, whether they play the flute or not.

H. A. POPLEY.

PREFACE.

The opening chapters of this little book formed the subject of a paper read at the 3rd., session of the All-India Oriental conference which met at the Senate House, Madras in the year 1924. The book has since been amplified and I have incorporated into it the fruits of my subsequent researches in this direction. The art of flute-playing has attained a very high degree of excellence in Southern India. Although various methods of playing this instrument are in vogue in different parts of India, yet one method alone has found general acceptance in the south ; and it is this method that is dealt with at length in Chapter IV. I am very much indebted to Rev. H. A. Popley for his foreword to this book and also for his kindness in reading through the proofs and offering valuable suggestions at various stages.

The publishers will issue vernacular editions of this book shortly.

Any corrections and suggestions towards the improvement of this book will be thankfully received.

“Sangeetashrama” }
G. T. Madras. }

P. SAMBAMOORTHY.

1st Finger-hole.
2nd Finger-hole.
3rd Finger-hole.
4th Finger-hole.
5th Finger-hole.
6th Finger-hole.
7th Finger-hole.
8th Finger-hole.

Mouth-hole.



Cross section.

Free end,

1/3 NAT. SIZE (See pp. 16 and 17.)

THE FLUTE.

INTRODUCTION

Notation.—In this book, the Seven Swaras, Sa (Shadjama), Ri (Rishabha), Ga (Gāndhāra), Ma (Madhyama), Pa (Panchama), Dha (Dhaivata), Ni (Nishāda) are written as s, r, g, m, p, d, n, omitting the vowel letters. A dot placed above a note indicates that it belongs to the higher octave, and conversely, a dot placed below a note indicates that it belongs to the lower octave. All other notes are middle octave notes. Thus $\overset{\cdot}{s}$ $\overset{\cdot}{r}$ $\overset{\cdot}{g}$ $\overset{\cdot}{m}$ belong to the higher octave; $\underset{\cdot}{s}$ $\underset{\cdot}{n}$ $\underset{\cdot}{d}$ $\underset{\cdot}{p}$ $\underset{\cdot}{m}$ belong to the lower octave; and s r g m p d n are middle octave notes. The duration of every small letter is unit time, and that of a capital letter is two units of time; thus $S=ss$, and $M=mm$ and so on. While a comma placed next a note indicates that its duration is increased by one unit of time, a semicolon placed next a note indicates that its duration is prolonged by two units of time. For indicating additional duration of the notes, combinations of semicolons and commas are employed thus:—

S , and s , , are each equal to 3 units of time :
 S ; = 4 units of time : S ; ; = 5 units of time : S ; ; ; = 6
units of time and so on.

Technical Terms:—A given series of notes is said to be in the *Ārohana-krama* or order, when the

pitch of each note in the series is higher than the pitch of the note preceding it; likewise, a given series of notes is said to be in the Avarohana-krama or order, when the pitch of each note in the series is less than the pitch of the note preceding it. Apart from this, the terms Ārohana and Avarohana have a special meaning with reference to rāgas. There, they mean, the prescribed order in which the notes ascend or descend in an octave in each rāga.

Swara = note, full tone

Sruti = half-tone, quarter tone, micro-tone;
the term 'sruti' also means key-note.

Sthāyi = octave; a series of seven swaras beginning with Sa and ending with Ni is termed a sthāyi.

Mandra Sthāyi = lower octave

Madhyama ,, = middle ,,

Tāra ,, = higher ,,

Rāgas are broadly classified into Janaka and Janya rāgas. The terms Janaka-rāga, Melakarta-rāga, Sampurna-rāga, Parent rāga and Scale-rāga are all synonymous and mean one and the same thing. Likewise, the terms Janya-rāga, Varja-rāga and Derivative-rāga are all synonymous and mean the same thing. Janaka-rāgas possess all the seven swaras in both the ārohana and the avarohana and

there are 72 such Janaka-rāgas. A Janya-rāga is a rāga whose notes possess the same characteristic features as the corresponding notes of the rāga from which it is derived (*i.e.*, the Janaka-rāga). In a Janya-rāga as a rule one or two (occasionally three) notes are absent either in the ārohana or in the avarohana or in both. Vakra-rāgas are a species of Janya-ragas.

Gamakas are the peculiar shakes and graces that lend charm to Indian Music.

Drone is a musical instrument that is used for sounding the Key-note or the Sruti. It is either a stringed instrument or a wind instrument. Tam-bura, Ektar and the Ottu are instances.

Nodal end = The closed end of the flute near the mouth-hole.

Free-end = The open end of the flute.

Mouth-hole = The circular aperture near the nodal end into which the wind is blown.

Finger-holes = The other holes of the flute closed by the fingers.

Cross-section of the flute = The width of the cylindrical bore of the flute.

Open area = The area of the mouth-hole left open to receive the current of air blown into it.

Pitch of the flute = The pitch of the note Sa of the flute.

THE FLUTE.

CHAPTER I.

Classification of Musical Instruments

Few countries in the world present such a rich variety of musical instruments as India. Several of them have existed from very ancient times. Many early Hindu Scriptures and Puranas make mention of several of them. The ancient Tamils who had an excellent system of music possessed several musical instruments. The *Silappadikaram* makes mention of a stringed instrument which had a thousand strings. The idea of such a complicated musical instrument might perhaps appear impracticable to the modern mind. Unfortunately for us, how that instrument was tuned and played, what was its musical range and capacity, is not known for want of proper and sufficient evidence. The number of musical instruments in actual use at the present day, is however, very very small compared with the innumerable varieties that were used by the ancients. Evidence is not wanting to show that many musical instruments of the west are of eastern origin. The Indian Swaramandala or the Sata-tantri-veena as it is more often called, is really the forefather of the modern piano. It should be noted however that while the strings of the Swaramandala were struck with two felt-covered

sticks and played, the strings in the modern piano, are struck by mechanical hammers. The Kinnaree, another stringed instrument named after its inventor Kinnara is one of the most primitive Indian musical instruments. It is interesting to note that the Bible also makes mention of a stringed instrument called the Kinnor.

Sārṅgadeva, in his immortal work *Sangeeta Ratnakara*, classifies musical instruments from two points of view :—

A. From the point of view of their structure and construction he classifies them into :—

1. Tata (तत) or stringed instruments. (In Tamil கரம்புக்கருவிகள்).
2. Sushira (सुषिर) or wind instruments; literally, a musical instrument having holes. (In Tamil துளைக்கருவிகள்).
3. Avanaddha (अवनद्ध) i.e. Musical instruments covered by leather or skin. (In Tamil தேதால்கருவிகள்).
4. Ghana (घन) literally meaning a solid and weighty instrument. These are time-keeping instruments. (In Tamil, these are called as காஞ்சனக்கருவிகள்).

B. Next, Sārṅgadeva classifies them from the point of view of their usage into :—

1. Sushkam (शुक्लम्) when the instrument itself is sounded without being accompanied by any vocal music or dancing.
2. Geetānugam (गीतानुगम्) when the instrument is an accompaniment to vocal music.
3. Nrittānugam (नृत्तानुगम्) when the instrument is an accompaniment to dance.
4. Dvayānugam (द्वयानुगम्) when the instrument is an accompaniment to both dance and vocal music.

But musical instruments can be broadly classified under three main heads :—

1. Stringed instruments
2. Wind instruments
3. Percussion instruments.

1. Stringed Instruments are of three kinds:—

(a) Those performed on by friction with a bow as the Violin, Sārangi, Dilruba and Esraj.

(b) The plectral instruments where the strings are plucked by a plectrum (or fingers) as the Veena, Gotuvādyam, Sitar, Swarabath, (the more correct name however seems to be swaragath) guitar and harp. The drone instruments like the Tambura and Ektar also come under this group.

(c) Those struck with a hammer either mechanically or otherwise as the Swaramandala and the Pianoforte.

2. Wind Instruments are of two kinds:—

(a) Those with a key-board, the wind being supplied by some mechanical contrivance commonly a bellows; the organ and the harmonium are instances of this class.

(b) Those in which the wind is supplied by the breath of the performer and having finger-holes.

These again are of two classes:—

(i) Those which are blown through vibrating reeds or tongues or mouth-pieces. The South Indian Nāgaswaram is an instance of this class.

(ii) Those wherein the wind is blown through orifices in the instrument itself like the flute.

3. Instruments of Percussion are of several kinds. Most of them are time-keeping instruments. A few like the Nagāra and Bheri are used for war-like and religious ceremonies.

To the class of drums belongs the Mridanga, Tablā, Nagāra, Dhol, Dholak, Damaru, Udukku and Kanjeera.

Several kinds of cymbals are also in use. These are exclusively time-keeping instruments and are made of metal. The Jātra is a very good example. It is largely used in Bhajana parties and Hari-kathās. Larger cymbals are used in temple ceremonies and orchestral music. Different kinds of castanets are also common throughout India.

Jalatarangam and Ghatam are two other interesting musical instruments which have attracted considerable attention in modern times. Pioneer artists in these two instruments have within recent memory shown their great possibilities.

CHAPTER II.

History and Antiquity

With the exception of certain rude time-keeping instruments and natural wind-instruments like the sankhu (conch-shell), it is certain that musical pipes are the oldest musical instruments known to men. We come across stringed instruments at a somewhat later period of human history. It is also certain that fretted instruments of the Veena type must have come into existence later than the fretless stringed instruments. Mention is made of different kinds of musical pipes in all the ancient literature of India. From very early times

instruments of the flute species seem to have found favour with all classes of people. Even in countries wherein we come across only a few stringed instruments, there exists a great variety of the instruments of the flute species. The ancient Indian flute had several forms and names. The Vamsa of which frequent mention is made in all the ancient books was one type of flute, while the Muralee, the instrument with which Lord Sri Krishna charmed the Gopis of Brindaban belonged to a different type.

Early History

Stage I.—How did the idea of preparing musical pipes of the flute type first strike the man? It was perhaps in this wise. In his sojournings after the necessaries of life, he came across bamboo forests from whence he heard sweet musical notes. Closer observations revealed to him that these sweet notes were the results of currents of winds dashing against the holes drilled on the sides of the bamboo stems by the chafers and the beetles in their innocent quest after food. The idea of preparing musical pipes by artificially drilling holes on the sides of such bamboo sticks or other suitable material and supplying his own air to produce the notes, naturally struck him. It is at this stage that we come across some musical pipes of a rude

kind, made of wood, bamboo or reed with a mouth-hole and with or without a few finger-holes, and capable of producing only a few notes. The Alph-horn of the Swiss and the Lure of the Scandinavians are instances of this class. With such instruments the primitive men were able to play with ease the few tunes they knew. It must be borne in mind that the musical range of the primitive musical compositions was very small.

Stage II.—With the increase of musical knowledge, we find attempts being made to increase the number of finger-holes to seven, to enable the sapta-swaras to be played with facility and ease. The seven notes were played in their ārohana-krama, by closing all the finger holes and opening them in succession from the right end towards the left *i.e.*, in the direction of the mouth hole, and *vice versa* for playing the notes in the avarohana-krama.

Stage III.—With the perception of subtler srutis of the octave and the recognition of distinct modes (melakartas) attempts were made to dispose the finger-holes at different distances from the mouth-hole in order that the different scales (modes) known to them, might be played with the same system of fingering, in a mechanical way. As a consequence distinct and separate flutes graduated to different scales came into existence. The method

of playing the different minor tones of the octave by the system of partial closing and opening of the finger-holes was yet unknown.

Stage IV.—It was very soon found inconvenient to change the flute with each change of mode. With the same flute, attempts were now made to produce the different minor tones of the octave by the partial closing and opening of the finger-holes. The advantage of an eighth finger-hole in helping to produce an additional lower octave note was also recognised and all subsequent flutes came to have eight finger-holes. At the same time, the system of fingering was gradually so modified as to admit of notes ranging over two and a half octaves to be played.

History of the Fingering System.—A detailed account of the system of fingering now in vogue is given in Chapter IV. The modern fingering system is indeed the highest development of the art. It has been arrived at after age-long experiments and is best suited to the needs of modern Indian music.

It is not possible for any fingering system as such, to have existed during the first stage of the evolution of the flute, since the primitive ones had few finger-holes and the player sometimes employed the fingers of his one hand and at other times the

fingers of both his hands to play the notes. Thus the system of fingering was not constant.

At the second stage, as all the flutes came to have seven finger-holes, the need for a definite system of fingering arose. The three fingers of the left hand (excluding the thumb and the little finger) and the four fingers of the right hand (excluding the thumb) came to be used for closing the seven finger-holes. The sapta swaras were played in their ārohana-krama by opening the finger-holes in succession from the right end towards the left *i.e.*, in the direction of the mouth-hole. The fingers opened and closed the holes like mechanical keys; the system of partial closing and opening of the finger holes was still unknown. Ultimately, this system of fingering was given up as being inadequate and unsuited to meet the increasing needs of music as it developed and its place was rightly taken by the modern fingering system.

CHAPTER III.

Varieties and Structure

There exists a great variety of the instruments of the flute species of which, some are blown with the mouth and others with the nose. The nose-flute or the Poojee of the Hindustani Garowans is an instance of the latter class.

In the *Sangeeta Ratnakara*, Sārṅgadeva^o enumerates the different instruments of the flute species current in his time, each having a mouth-hole and a varying number of finger-holes:—

1. Vamsa (वंशः)
2. Pāva (पावः)
3. Pāvika (पाविका)
4. Muralee (मुरली)
5. Madhukaree (मधुकरी)
6. Kāhalā (काहला)
7. Thundakinee (तुण्डकिनी)
8. Chukka (चुक्का)
9. Sringam (शृंग)
10. Sankha (शङ्खः)

Of these, the Vamsa very nearly corresponds to the modern flute.

After cataloguing these, the author goes on to say that in his time, there were different schools of music which held different opinions regarding the distance between the mouth-hole and the finger-holes.

According to the author of the *Ratnakara*, the diameter *i.e.*, the width of the bore of the flute-pipe should be about an inch; and every flute should have eight finger-holes, each hole to be as big as to allow a badari seed (இலந்தங்கொட்டை) to freely pass through it. The *Silappadikaram*, however,

gives the following details regarding the dimensions of the flute. "The length should be twenty inches and the circumference of the composing material four and a half inches. The diameter of each finger hole is to be the length of a paddy grain. The flute, which should be an exact uniform cylindrical tube, open at both the ends without the presence of nodes, should be closed at the left end by wax or other material and the mouth-hole should be bored on the side of the pipe at a distance of 2 inches from the nodal end. The distance between the mouth-hole and the first finger-hole should be 7 inches and, leaving a free space of 2 inches at the right end, 8 finger-holes are to be bored on the remaining length in such a manner that the centres of the mouth-hole and all the finger-holes lie in the same straight line." Though such a flute will be somewhat bigger in size than the modern type, yet it is capable of producing a deep and pleasing note. Probably the *Silappadikaram* is the earliest work which prescribes that flutes are to be graduated to the Harikāmbhoji mode. The system of fingering mentioned in the Tamil epic is however different from the one in vogue at the present day. But the system of closing the seven finger-holes with the three fingers of the left hand, (excluding the thumb and the little finger) and the

four fingers of the right hand (excluding the thumb) is mentioned in the *Silappadikaram* and all the other classical treatises on Indian music.

The substances out of which a flute might be made are :—

1. Vainava (Venu), or the bamboo
2. Kādara or wood used for the sacrificial post.
3. Ivory
4. Sandalwood
5. Rakta Chandanam or the red variety of sandalwood
6. Ebony
7. Iron
8. Bell-metal or Bronze
9. Silver
10. Gold

Of the above, the bamboo is selected as pre-eminently the best fitted for the flute, on account of the excellent quality of its tone and its fine resonating properties.

A bamboo or other material selected for preparing a flute must be cylindrical, straight and smooth and free from notches, depressions and protrusions and must not have nodes at either ends. The bamboo selected must neither be too old nor too young and in its wild condition must

not have been rocked to and fro by the winds; further it must not have been bored by the beetle, or the chafer. A bamboo satisfying all these requisite conditions must be dried in the shade for a year and then only holes should be bored on its sides. Some eminent flutists, at the present day, however, use flutes which have nodes. While the length of a modern concert flute rarely exceeds fifteen inches, its circumference never exceeds three inches (Cf. the flute described in the *Silapadikaram*).

The flute is perhaps the only musical instrument that approaches the human voice in several respects. Its musical range is slightly over two and a half octaves like the musical range of a well cultivated human voice. Like it, it is capable of giving out only one note at a time. Further the technical process underlying the production of jantawaras is, in both, the same.

CHAPTER IV.

Practice

The Indian Flute is a simple cylindrical tube of uniform bore, closed at one end. This end is called the nodal-end and near this nodal-end is a circular aperture called the mouth-hole. The other end of the flute is called the free-end. The



finger-holes, which are ordinarily eight and sometimes nine, are somewhat smaller in size than the mouth-hole. The centres of the mouth-hole and the finger-holes lie in a straight line. The finger-hole nearest the mouth-hole is reckoned as the first, and the adjoining one as the second and so on. While the two thumbs of the hands are used to hold the flute in position, the three fingers of the left-hand (excluding the thumb and the little finger) and the four fingers of the right hand, (excluding the thumb) close the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th finger-holes as shown in the figure. For the sake of convenience and easy reference, the fingers that close these seven finger-holes are termed the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th fingers respectively. The flute is held in a horizontal position with the edge of its mouth-hole just touching the centre of the lower lip. It is so held that the finger-holes are to the right of the player. It is played by directing a current of air from the mouth into the mouth-hole and by opening and closing the finger holes.

Note. The illustration at the commencement of this book shows the different parts of the flute. The adjoining illustration shows the position of the different fingers on the flute and also the correct method of holding the same.

TABLE I.
Directions for playing the Seven Swaras

Name of the Swara or note.	Corresponding Eng. solfa letters	Directions.
S (Sa) स	d (doh)	...Close the first two finger-holes and blow a steady current of air into the mouth-hole.
R (Ri) रि	r (ray)	...Close the first finger hole only and blow as above.
G (Ga) ग	m (me)	...Open all the finger-holes and blow as above.
M (Ma) म	f (fah)	...Close all the finger-holes except the first and blow as above.
P (Pa) प	s (soh)	...Close the first five finger-holes and blow a stronger but steady current of air
D (Dha) ध	l (lah)	...Close the first four finger-holes and blow as for Pa
N (Ni) नि	t (te)	...Close the first three finger-holes and blow as above
Ṡ (Sa) स	d' (doh)	...Close the first two finger-holes and blow as above.

Note that the higher octave Sa is produced by blowing a strong current of air into the mouth-hole, the fingers remaining in the same position as for the middle octave Sa; likewise, the notes Ri, Ga and Ma of the higher octave are played by blowing into the mouth-hole a stronger but steady current of air, the fingers remaining in the same positions as for the middle octave Ri, Ga and Ma.

A flute is said to be graduated to the Hari-kāmbhoji scale, when by playing the seven notes in the manner mentioned in the above table, the Hari-kāmbhoji scale is heard. The system of fingering mentioned in the above table for the production of the seven notes of the octave might appear at first sight as arbitrary. But the reason underlying it will be seen presently. With this system, it is possible to play notes ranging over $2\frac{1}{2}$ octaves, while with any other system of fingering, it may not be possible to play notes ranging over such a wide range. It is only this system, arrived at after age-long experiments, that has found universal acceptance. It is also best suited to the growing needs of modern Indian music.

Lower octave notes.—The notes Ni, Dha and Pa of the lower octave are played by blowing a light and steady current of air into the mouth-hole, the fingers remaining in corresponding positions. The note Ma is produced by closing the first six finger-holes and the note Ga by closing the first seven finger-holes and by blowing in each case, a very light and steady current of air; otherwise, the corresponding middle octave notes will be heard. The two notes Ma and Ga will be correctly heard if the flute is properly graduated. The lower octave Ri note is produced by closing all the eight finger-holes and

by blowing an extremely light and steady current of air into the mouth-hole. It is only here that the little finger of the left-hand is used, and closes the 4th finger-hole, so that the four fingers of the right hand, in this particular case, close the 5th, 6th, 7th and 8th finger-holes. The lower octave Sa (Mandaram) is produced by lessening the area of the mouth-hole by slightly twisting up the flute and blowing a very very light stream of air, the fingers remaining in the same position as for the lower octave Ri. Without special practice, it may not be possible to produce this mandaram note to perfection.

Janta-Swaras

What are Janta-Swaras? When two or more notes of the same pitch and intensity are played or sung in succession such swara-groups are termed janta-swaras. Though janta-swaras primarily mean swara groups of two notes each as, **ss rr gg mm** yet by an extended sense, the term has been applied to swara-groups of three and four notes as **sss rrr** and **ssss rrrr** etc. In Indian music, the janta swaras play a very prominent part. Students of music generally devote more time and attention to the practice of janta-swara exercises. What is the real nature of these janta-swaras? Just imagine a plain note being sounded. Suppose, about half-way

it is just interrupted by the sound of the immediate lower note. What is the consequence? You hear the original plain note as two distinct notes. This is the phenomenon underlying the janta-swaras.

Now, **ss rr gg mm pp dd nn ss** is a group of janta-swaras. If this group is played on an instrument in the vilamba kāla (*i.e.* in a slow speed) then any careful listener will perceive the note that is just touched in passing, between the first and the second note of each janta-group. This intermediate note, that is touched in passing, is the note immediately below the janta-swara. To be clear, in playing the janta-group, **ss rr gg mm** the notes that are actually played are **sns rsr grg**

mg n. Graphically represented these janta-swara groups appear like a series of troughs. The intermediate note is in each case so quickly slurred over, that instead of hearing the notes **sns rsr grg mgm** distinctly as such, we only hear **ss rr gg mm**. What is the exact function of this intermediate note? It simply serves to break the continuity of the swara, enabling us to hear the group as **ss rr gg mm** which otherwise would be heard only as **s, r, g, m**. No doubt it is quite easy to play the janta-swaras, **ss rr gg mm** etc., by blowing a puff of air into the mouth-

hole for each individual swara; but the resultant effect will not be the same; and the janta-swaras when played in this way will be heard only as **s s r r g g m m** etc., distinctly as such, and not as **ss rr gg mm**. Further, in such a case we are sure to miss the delightful charm of the janta-swaras, on account of the absence of the intermediate note, which serves as a happy link between the notes of each janta-swara group. It is advisable in the early stages to play each janta-group in one breath, and then attempt to play two or more janta-groups in one breath.

Note—The following table gives the method of playing the janta-swaras. In the light of the above explanation, the reasons underlying the directions given, will be well appreciated. Care must be taken to see that each janta-swara group is played in one single steady continuous breath. For instance, in the janta-swara group **ss**, the first note **s**, the intermediate note **n** and the second note **s** should all be played at a stretch and in one uniform breath. The duration of every intermediate note is less than a fraction of a second. Where a direction is given to strike a finger-hole, special care ought to be taken to see that the corresponding finger just grazes the edge of the particular finger-hole and never completely closes it. Failure to take proper caution in this point will result in the intermediate note also being heard distinctly, and instead of hearing **ss rr gg mm** which is our aim

we should be hearing **sns rsr grg mgm** distinctly as such which is the very thing we want to avoid. It must be remembered, that this intervening subordinate note serves only to split the principal note into two. Let it be borne in mind that the principal note is played even after the intermediate note is sounded and stopped.

Table II.

Janta-swaras.	Directions.
s s	Play the note s and after a while just strike the 3rd finger-hole with the 3rd finger.
r r	Play the note r and after a while just strike the 2nd finger-hole with the 2nd finger.
g g	Play the note g and after a while just strike the 1st finger-hole with the 1st finger.
m m	Play the note m and after a while quickly open and close the third finger-hole.
p p	Play the note p and after a while just strike the 6th finger-hole with the 6th finger.
d d	Play the note d and after a while just strike the 5th finger-hole with the 5th finger.
n n	Play the note n and after a while just strike the 4th finger-hole with the 4th finger.
s s	Play the note s and after a while just strike the 3rd finger-hole with the 3rd finger.

The higher octave janta-swaras **rr gg mm** and the lower octave janta-swaras **nn dd pp** are played in the same manner as the corresponding middle octave janta-swaras. If the student is in possession of a Harikāmbhoji flute, then the Harikāmbhoji scale janta-swaras will be heard by playing in the above manner. With such a flute the janta-swaras of any other scale can be played, by the application of the same process.

The Minor Tones.—The notes Shadjama and Panchama admit of no varieties. The remaining notes Ri Ga Ma Dha Ni admit, in the first instance, of two varieties each. Of the two varieties of any one swara, the pitch of one is less than that of the other; the former variety is designated a komal swara and the latter a tivra swara. It is not always quite correct to speak of the komal and tivra varieties of the swaras as synonymous with the flats and sharps in western music; and this fact will be borne out by a perusal of Table III on the next page. The characteristic notes pertaining to the Harikāmbhoji scale besides the constants Shadjama and Panchama are, Chatusruti Rishabha, Antara Gāndhāra, Suddha Madhyama, Chatusruti Dhaivata and Kaisiki Nishāda. Now we shall see how the remaining minor tones of the octave are played.

The following table gives the English names for the corresponding terms in Indian music:—

TABLE III.

Indian terms.		Corresponding English names.
S. Indian.	N. Indian.	
<i>Shadjama</i>		C
Suddha Rishabha	Komal Ri	D flat
Chatusruti „	Tivra Ri	D
Sadharana Gandhara	Komal Ga	E flat
Antara „	Tivra Ga	E
Suddha Madhyama	Komal Ma	F
Prati „	Tivra Ma	F sharp
<i>Panchama</i>		G
Suddha Dhaivata	Komal Dha	A flat
Chatusruti „	Tivra Dha	A
Kaisiki Nishāda	Komal Ni	B flat
Kakali „	Tivra Ni	B

The method of playing Chatusruti Rishabha, Antara Gandhara, Suddha Madhyama, Chatusruti Dhaivata and Kaisiki Nishada is already known to the student since they are the notes of the Harikambhoji scale. The following table gives the method of playing the remaining notes of the octave:—

TABLE IV.

Name of the note.	Directions.
Suddha Rishabha	Close the 1st finger-hole and partially open the 2nd finger-hole and blow a steady current of air into the mouth-hole.
Sādhāraṇa Gāṇdhāra	Open the 1st finger-hole partially and blow as above mentioned.
Prati Madhyama	Close the 1st five finger-holes and partially open the sixth, and blow as above mentioned.
Suddha Dhāivata	Close the 1st four finger-holes and partially open the 5th and blow as above mentioned.
Kākali Nishāda	Close the 1st two finger-holes and partially close the 3rd and blow as above mentioned.

The other four notes Shatsruti Rishabha, Suddha Gāṇdhāra, Shatsruti Dhāivata and Suddha Nishāda, differ from their neighbouring notes by only a small fraction of a tone. Hence, they are usually played by air adjustment, the fingers remaining in the same position as for the neighbouring notes. It is useless to attempt to play these four notes, unless one has a very firm grasp of the exact position of these notes on the octave.

Gamakas

An expert flutist displays all the delicate shades and subtleties of the ragas, in as exquisite and accurate a manner as a vocalist or vainika. The three factors that help him in playing the different kinds of gamakas are :—

(a) The up and down movement of the face along with the flute, which has the effect of controlling the supply of air into the mouth-hole by artificially decreasing and increasing its open area.

(b) The gradual opening and closing of the finger-holes.

(c) Adjustment of the strength and volume of air blown into the mouth-hole.

Proficiency in playing the different kinds of gamakas is attained, amongst others, by practising the more advanced chowka kritis of Tyāgarāja, the scholarly compositions of Muthuswamy Dikshita, Syama Sastri and Kshetriyulu and the Kritis and Varnas of Pallavi Gopalayyar.

Finger-strokes and Thuthukarams

Finger-strokes (விரலடிக்கள்) are used to play the madhyama and trikala sangatis in musical compositions and are of great importance. The use of finger-strokes in appropriate places renders flute-

playing a° real treat to the ear. Some flutists erroneously use them frequently in Rāga-ālāpana and this, not to a little extent, mars the otherwise beautiful effect. Proficiency in this branch of flute-playing is attained by practice of the janta-svara exercises.

Thuthukāram (துதுகாரம்) is the modern recognised method of playing the madhyamakāla swaras. It corresponds to what is known as the Swara-Vil (ஸ்வரவில்) in violin-playing in the Indian method. In thuthukāram, a puff of air is blown into the mouth-hole for playing each swara, however fast the swaras might be played. Unless the thuthukārams are practised to a refining degree, the rapidly blown puffs of air will be heard which to a considerable extent might spoil the otherwise melodious music. Sarabha Sastrigal of revered memory reached the ideal in this respect.

Flute-playing: Some Essentials

1. There should be uniformity and sāvadāna or steadiness in playing, without being either too high or too low.
2. The sound should neither be feeble nor echoing ; neither faltering nor shaky.
3. There should be economy of breath and avoidance of effort.

4. It is desirable that flutists should cultivate vocal music and also understand the meaning of the pieces they play, since then, they will be able to play them with real spirit and feeling, just as a vocalist who understands them will render them.

5. Flutists must possess, command over fingering and accuracy in playing ragas. They must guard against the attempting of gamakas at irrelevant places. They should also be able to play the lower octave notes with ease and also be conversant with the ragas of the Prati-Madhyama group.

Some prevalent false notions

It is a pity that some false notions regarding the musical possibilities of the flute have gained currency. From the fact that flutes are generally graduated to the higher srutis, it is thought that flutes cannot be graduated to the lower srutis. In fact, one can have a flute graduated to any lower sruti, and such a flute might even be used as a decent accompaniment to any masculine or bass voice. Again, from the fact, that flutes are normally graduated to the Harikāmbhoji scale, some people think that it is not possible to graduate flutes to the other primary scales. It is quite possible to have flutes graduated to any scale, and as has already been pointed out in Chapter II, different

scale-flutes were in actual use at a particular stage of its evolution. The flute is one of the most ideal musical instruments that we possess at the present day, standing on a par only with the veena and even surpassing it in certain respects; for, very fast pieces, which cannot be played to perfection even by the skilled vainika, can be played by an expert flutist. It is a very delicate instrument helping us to study the laws and properties of musical notes and air-columns.

* * * *

The only musical instrument that perhaps tires and discourages the beginner in the earlier stages is the flute. To get to blow a clean note alone takes some days, and in the case of some, it takes even weeks. The beginner should not get dejected. He should continue his practice with patience and diligence. Even after getting to play a clean note, it really takes some months before the annoying whizzing sound finally disappears. In the initial stages, the beginner will do well, not to practise for more than twice a day; it is also desirable for him to restrict the time of practice to about twenty minutes each time; once, he gets accustomed to flute-playing, he can prolong his practice for an hour or even more. Systematic practice at regular intervals is productive of very good and encourag-

ing results. The giddy sensation that is experienced in the earlier stages is common to one and all and this thing need not deter the beginner. Flute-playing perhaps is not suited to certain constitutions but there is nothing in it that is inherently harmful. On the other hand, it is a good exercise for the lungs, provided it is done regularly and systematically at periodic intervals.

A student of average abilities can, after a year's practice, play the simple gitas, swarajatis and varnas. Another year's practice will enable him to play slightly difficult varnas and simple kritis. At the close of the third year, he should be able to play varnas of a difficult nature and kritis involving simple gamakas and madhyamakāla sangatis. Yet another year's practice, will enable him to play chowka kritis, other musical compositions of an advanced nature, simple ragas and extempore swaras. Unless a student puts in at least an hour's practice per day, it is not possible for him to progress at the rate mentioned above. It need hardly be mentioned that a careful and judicious selection of graded exercises and songs will greatly help the beginner in attaining proficiency much earlier.

CHAPTER V.

The Laws

The principal factors that determine the pitch, intensity and quality of the flute-note are :—

1. The nature of the wood or other material composing the flute, *i.e.*, the substance of which the flute is made of.
2. The thickness and the density of the composing substance.
3. The uniformity of the cylindrical bore of the instrument.
4. Its cross-section.
5. The distance between the mouth-hole and the finger-holes.
6. The strength of the current of air blown into the mouth-hole.
7. The area of the mouth-hole left open to receive the current of air blown into it.

(*Note.*—It is a mistake to suppose that the entire mouth-hole is always left open to receive the current of air blown into it. A small portion of it is invariably covered by the lower lip.)

8. The partial or entire closing or opening of the finger-holes.

The Laws

[Here and elsewhere the pitch of the flute means the pitch of the fundamental note Sa of the middle octave of the flute.]

Note.—The laws mentioned below hold good, provided in each case, the other factors remain constant. The distance between the mouth-hole and the finger holes must lie within certain maximum and minimum limits which will however vary in flutes of different substances.

1. The pitch of a flute is the same, whether it is made of bamboo, ivory, ebony, wood, glass or metal. The quality of the notes of the flutes of these various substances will however differ. The different composing materials do no more than give rise to different harmonics and thereby impart a different quality to the compound tone produced.

2. The greater the thickness and density of the composing material, the deeper the note; conversely, the thinner and less dense the composing material, the shriller the note.

3. The flute note will not be of uniform intensity throughout, unless the cylindrical bore is uniform.

4. The pitch of the flute varies inversely as its cross-section.

5. The pitch of the flute is inversely proportional to the distance between the mouth-hole and the finger-holes.

6. The pitch and intensity of a note vary directly as the strength of the current of air blown into the mouth-hole.

7. The pitch of a note varies directly as the area of the mouth-hole exposed to receive the current of air blown into it.

8. The pitch of a note again, varies directly as the area of the nearest finger-hole left open for the exit of the air blown into the mouth-hole.

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The flute from very early times, was both an accompaniment and a primary instrument. For centuries, its use was confined to particular classes of people like the cow-herds and the nattuvans. But it soon came to occupy an exalted position and princes and other dignitaries began to specialise in the art of flute-playing. It is older than the veena and perhaps is the only portable instrument useful alike for chamber and out-door music. It is the instrument, with which Lord Sri Krishna charmed the Gopis of Brindaban in times of yore. To play the flute during a boat journey on a river is really a delight and a privilege too.

During the times of the Hindu kings and the benign Moghul Emperors, the art of flute-playing

flourished well. But, from the time when music was banished from the palace and forced to seek refuge in the street the art began to decay gradually. For some time its use was confined to nautch-parties alone till it once again gained its former supreme position as a primary instrument for concert purposes. There are good flutists even at the present day and some pioneers in the art have lived within recent memory. It was given to the immortal Sarabha Sastrigal, to demonstrate to the world at large, the immense musical possibilities of the flute and to raise its status in the Indian musical world to-day. Thousands there are, both Indian and European even at the present day, who bear eloquent testimony to the musical feast they enjoyed by attending his flute concerts. Since his time, the flute has attracted more and more people including the intelligentsia of society, and it is also gratifying to note that members of the fair sex are now trying to specialise in this art. May the Divine Grace of the Almighty be upon all those who practise this celestial instrument.