INTRODUCTION TO THE
STUDY OF INDIAN MUSIC

AN ATTEMPT TO RECONCILE MODERN HINDUSTANI MUSIC WITH ANCIENT MUSICAL THEORY AND TO PROPOUND AN ACCURATE AND COMPREHENSIVE METHOD OF TREATMENT OF THE SUBJECT OF INDIAN MUSICAL INTONATION

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FOREWORD

THE time is perhaps far distant when it will be possible to write a connected history of Indian music, tracing its origins, development, and old age. It is clear, however, that its golden age—that period so short in the history of any art cycle, and so prepotent in determining the modes of both art and life for long subsequent periods—must lie far back from the present. Not improbably, that golden age coincided with the moment of greatest achievement in drama, Kalidasa, and for the theory, Bharata. Long anterior to this, however, music was a most highly cultivated—perhaps the most highly cultivated—of Indian arts, and to the present day it has remained the most continuously vital and most universally appreciated art of India. Taking together what has been lost, and what remains, music is, then, the most complete expression of the soul or genius of the Indians—a mirror faithfully reflecting their inner life. That English Orientalists and educationists have so long ignored this music, is the measure of their misunderstanding of India.

While it is true that, until modern times music has remained in the best sense one of the most popular of Indian arts, it is also true, though with exceptions, that it has been neglected and despised, for example, by Aurangzeb, as well as by more modern puritans. But the music remained too intimately associated with religion, with the drama, and with life, whether courtly or popular, and was too faithfully guarded by the traditions of the guilds for it to be possible that it should die out altogether. There are to be found even now, for the most part at the courts of Indian rajas, or in specially musical towns like Lucknow, Tanjore, and Poona, a few ustads who are artists of high, and even of supreme rank ; but they belong to an order that is passing away.

The neglect of centuries, as in so many analogous cases, has proved less disastrous than the renewed patronage of a few decades. The constant use of the tempered harmonium; the endeavour to adapt Indian modes to the purposes of tenth or fifteenth-rate brass bands maintained by Indian rajas; the absence of any æsthetic element in modern Indian education; the mania for English accomplishments: all these causes have actively contributed to the degeneration of Indian music. By degeneration, I mean literally confusion, a running together, and destruction of bounding-lines; a process quite distinct from any natural waning of vitality at the latter end of an art cycle.

Now that life has changed, so that the old music, however splendid, no longer expresses race-intention (we are no longer united by such an intention), there are two considerations that must weigh with us, when we think of Indian music; to maintain the memory of our past experience, as an interpretation and inspiration and delight, and to clear the way for new creators. For both these ends it is necessary to escape from the confusion into which the theoretical part of Indian music has unfortunately fallen. It is here, I think, that Mr. Deval has done great service in applying a purely experimental method to the analysis of the actual intonation of thoroughly trustworthy hereditary musicians. Mr. Deval's work, the results of which are published in his "Hindu Musical Scale and the Twenty-two Srutees," deserves the highest praise. It is true that Mr. Deval did not succeed in his endeavour to improve his case by importing aid and corroboration from scientific acoustics and Sanskrit philology; but I think that certain of his critics fall into more serious error when they judge the results of his patient and invaluable experimental work by weakness or inaccuracies in his method of presentation.

The preparation of the sruti harmonium, and the presentation of the general results of Mr. Deval's work, combined with a critical discussion of the theory of music according to Bharata and Sârangdev in Mr. Clements' most interesting book, mark, I think, an epoch in the scientific study of Indian music. It will at any rate be possible for future writers, even when they disagree with Mr. Clements to say more clearly

and definitely than heretofore, what they exactly mean; and still more important, for future recorders to make a nearer approach to a true transcription of the Indian râgas. I cannot but hope that Mr. Clements will himself extend his studies in this direction. It may be a long time before we have as full and as exact a knowledge of Indian music as we have of Indian literature; but if that time ever comes, it will, I am sure, be acknowledged that the work of Mr. Deval and Mr. Clements did much to clear the way for such a development of knowledge.

I should like to say a word of warning with regard to the sruti harmonium. This instrument is to be welcomed, in any case, as infinitely preferable, from the standpoint of intonation, to the tempered harmonium now in common use. It is a valuable tool, and may be used for purposes of research, and also for class teaching, where the instruction of large classes (a process foreign to the Indian conception of educational method) is unavoidable. Thus used, the sruti harmonium will serve the ends of exact knowledge, and will not (as the tempered harmonium now does) destroy the sensitiveness of the Indian ear to those "hair's-breadth" distinctions which are essential to a highly evolved art of pure melody. But, as I think, no harmonium of any kind should ever be regarded as a *substitute* for the tambura, because the quality of tone of the tambura is so infinitely superior to that of the harmonium, to say nothing of other æsthetic and social considerations; above all, the harmonium should never be used as an accompaniment to the voice, leading or imitating note by note. This last, even with the vina, would be foolish; with a blatant instrument like the harmonium, incapable, moreover, of any gliding from note to note, it becomes repulsive.

Much the same argument applies to the use of a system of notation; for the purposes of exact knowledge—most desirable as a means of escape from the present chaos—it is very important that a suitable method of transcription should be discovered. But the publication of Indian music in staff notation, without warning that the scale is other than that usually implied by that notation, tends to the destruction of the character of that music in the same way as the use of a tempered harmonium. It is for the purposes of science, of

teaching, of the preservation of existing songs, and the making of these accessible to Western students, that a notation is now so necessary—above all, for the preservation of what is so rapidly disappearing, and must soon be lost. But if it be possible to maintain still, amidst the general popularization of music in the modern and democratic sense, a tradition of master-musicians in pupillary succession, as heretofore, then for these it is far better that the method of oral transmission should be maintained. No matter if the masters in different parts of India do not all agree; the very divergences of their râgas may be an expression of local character. But it is not for the sake of variety that I would preserve the system of oral transmission; but rather because this is the true method of learning for an artist, because every singer so taught must be in some degree a composer (he is taught, not merely to repeat a given song, but to sing in a given mode and mood), and because it is so great an advantage for the true musician to need no external aid to memory, such as a printed score. Indeed, I suppose that even if we succeed in recording the greater part of Indian music as it still survives, the music itself cannot persist as a part of everyday life unless it is thus handed on as a sacred tradition.

In any case it is much that the existing music should be recorded and analyzed for the student of whatever time or country. The necessity of such a record in India need not be dwelt upon; but perhaps the most valuable result of the growing interest in Indian music would be realized if the time ever comes when in the words of Captain Day, "the study of the national music of the country will occupy, as it should, a foremost place in all Indian schools," and certainly, also, in the Universities. But I should also like to emphasize the importance of this study for western musicians; not only as a means of better understanding the heart of India, but also because it must be in the long run disadvantageous to ignore one half of the world's experience in any art. If Indian music is very different from European—and the fundamental difference is less than at first sight appears—then all the more reason for the Western musician to enlarge his outlook. Perhaps even, in the words of M. Bourgault-Ducoudray, Oriental music may "provide Western musicians with fresh

resources of expression, and with colours hitherto unknown to the palate of the musician." At least we may feel certain that both for us, and for the Western student, the exact study of the science of Indian music is a necessary process in the interests of progress and interpretation.

It is then with gratitude that I have accepted Mr. Clements' invitation to write a preface to his learned and stimulating work; in so doing I wish to specially commend both the whole subject of Indian music, and this book, to the notice of all Indians and Englishmen who have any voice in determining modes of education in India.

ANANDA K. COOMARASWAMY.

LONDON,
September 12, 1912.

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Those who invent notations no better than others already in existence, with an elaborate superfluity of new and wonderful signs, in the hope of handing their names down to posterity as inventors are friends of doubtful sincerity. Those who use the staff-notation for the purpose, without attempting to distinguish the special features of Indian intonation, are encouraging the heresy that intonation is of minor importance. Those teachers who promote the sale of tempered harmoniums, and make use of them in the class-room, are proving their own incapacity to guide the musical

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renaissance of their country. The head of one institution finds the tempered harmonium an excellent means of teaching beginners "the scale." What scale, one may ask, for it does not give a reasonable approximation to any Indian scale? He admits that the "peti," as it is commonly called, cannot render all the Râgas; has he not, in his publications, drawn attention to this defect? When the beats given by the fifths, fourths, and thirds of his instrument are shown to him, he says that he is aware of them, and considers them somewhat like the Indian embellishment known as "kanpit." When asked whether he follows the teaching of Sârangdev, the author of the Sangit Ratnâkar, he replies: "He is not really an old authority; we go back to the Sâma Veda; we are of opinion that Sârangdev is wrong in many respects, and we reckon our srutis downwards instead of upwards."[1] To go back to the Sâma Veda is a happy inspiration, as that work, so far as it touches the question of scales, deals in pure generalities.

Europeans, on their part, are too ready to assume that the Indian scales are artificial and capricious, and too prone to ascribe to "quarter-tones" distinctions between intervals with which they are not familiar, such as the difference between the major-tone and the minor-tone. Intervals less than a semitone are frequently employed in grace or embellishment, but very seldom in scales. When they form part of a scale, it is possible in many cases to regard them as constituents of natural chords of the seventh, the tempered equivalents of which are well known to the Western musician as discords. It is also a prevalent idea that, in the study of Indian music, intonation may be neglected as being of minor importance. This view is, however, demonstrably wrong; the student who masters the subject of intonation will find no difficulty in solving the remaining problems of Indian musical theory.

The following pages deal with the subject of intonation, principally as applied to the school of music known as the Hindustâni School. The author ventures to hope that when once the rationale of the "kaishiki" or hair's breadth distinctions of the Sangit Ratnâkar is grasped (and may the reader

[1] See p. 48.

beware of following a certain well-known author, and calling them "aggravating") writers and teachers will no longer be found ignoring the difference between the ri of Bhup and the ri of Deshkâr, the ga and ni of Kâfi, and the ga and ni of Bahiravi. As it is impossible to treat the subject of intonation adequately without an appropriate musical notation, part of this volume will be devoted to the presentation of a method by which Indian music may be accurately written. The researches of Mr. Deval of Sangli, which have rendered possible the scientific treatment of the subject in hand, will be described, and an account given of the Indian harmonium by means of which the accuracy of his conclusions has been demonstrated. Passages from the Nâtya Shâstra of Bharata and the Sangit Ratnâkar will be quoted and commented upon in the light of this new science of intonation. It will be found that interesting conclusions suggest themselves as to the early beginnings of the Hindu scales. As a result of the author's conclusions, tentative suggestions will be made as to the scientific classification of the Indian scales. For the sake of those who are interested in European instruments the manner in which they may be adapted to perform Indian airs in correct intonation will be explained.

The author wishes to acknowledge his indebtedness to Mr. V. N. Bhâtkhande of Malabar Hill, Bombay, the publisher of Lakshya Sangit, and author of Hindustâni Sangitâchi Paddhati, and other works, but for whose generous help in the way of translating and collating Hindu texts this volume would never have been written.

E. C.

September 9, 1912.

INTRODUCTION TO THE STUDY OF INDIAN MUSIC

CHAPTER I

THE SRUTIS OF MODERN HINDUSTANI MUSIC

MR. A. M. CHINNASWAMI MUDLIAR writes in his "Oriental Music in European Notation:" "Considering the prodigious number of nationalities and the diversity of provincial dialects in existence throughout the length and breadth of the Indian Empire, it should be no matter of astonishment if there be found any number of heterogeneous systems, as well as incongruous classifications in standard works forming the musical literature of the land. The primary distinction is into two classes, Mârga (celestial) and Deshi (terrestrial); the latter is now broadly divided into Hindustani and Karnâta, the former representing the school established by Hanuma, and the latter the much more ancient and authentic system introduced by Nârada, the inventor of all Arts and Sciences. It is clear, however, that local tastes and methods of training have considerably upset the theories originally propounded. . . . Of late the Hindustâni element (which has itself much deteriorated owing to foreign admixture) has been ingrafted on the Dravidian modes to an alarming extent."

The Hindustâni and Karnâtic schools of music.

Mr. Mudliar's opinions as to the respective merits of "Dravidian" and Hindustâni music, and on the subject of deterioration, are interesting, but in view of the fact that he accepts the tempered scale and the European tempered notation as a medium of instruction, they need not command acceptance. His volume is a praiseworthy effort and most valuable to the student, but, owing to a deficiency in the

critical faculty as regards musical intonation, Mr. Mudliar unfortunately encourages the worst kind of deterioration which has ever affected Indian music. The present work deals with Hindustâni music only; the author hopes to be able to show that a great part of it is directly traceable to the systems set forth in Bharata's Nâtya-Shâstra of about the fifth century A.D., and the Sangit Ratnâkar of the thirteenth century. These are the most closely reasoned and critically worded of the early text-books. It is reputed that Sârangdev, the author of the Sangit Ratnâkar, was an inhabitant of Kashmir. From internal evidence one would conclude that the music he describes is that of Hindustân. However, the pandits of Southern India endeavour to appropriate him to themselves. The present writer hopes to show that it is only by doing violence to his theory that it can be applied to Karnatic music. Roughly speaking, Hindustâni music may be said to prevail in the north and west of India and the Deccan, while Karnatic music is confined to the south and east. Many scales are common to both, but the general spirit of the two systems is apparent from the scales which are first taught to beginners; in the west, the scale is the same as the just major scale of Europe,[1] in the south it is a chromatic scale (known in Hindustâni music as the scale of the Râga Bhairava) with semitones between the first and second, third and fourth, fifth and sixth, seventh and eighth degrees.

Indian music—the Grâmas, Jâtis, and Râgas.

There are grounds for believing that the remote precursors of these two scales were pentatonic, one the scale which has been found amongst almost all nations and which may be roughly indicated thus— , D, E, G, A, C, and the other the old Greek scale of Olympus. Complete scales of seven notes were in existence many centuries before Christ, and the notes bore the "tonic-solfa" names sâ ri, ga, ma, pa, dha, ni, abbreviations of shadj, rishabh, gândhâra, madhyam, pancham, dhaivat, nishâd. Ancient theory puts the development of scales and melodic forms in the following order: first came the *Grâmas*, which may be regarded as collections of notes definitely related to one another by musical intervals. Writers on the subject persist

[1] Sometimes the scale with the high sixth is used; the practise in this respect does not appear to be uniform.

in thinking of the Grâmas as scales because each was named after a particular note. This was not the mode of thought followed by Bharata and ârangdev. A grâma might be regarded as a string of notes ranging through three or four octaves. To sing a scale out of the string, a starting-point must be chosen. A scale of seven notes from the string was called a *Murchhana* of the note so chosen. This was the second step. A scale which was to form the basis of a melody required something beyond a "lowest note," something to establish its harmonic individuality. The *Jâtis* were elaborated as the third step; their character was largely determined by the note chosen as the drone or pedal accompaniment; they also had a fixed final note, and Vâdis and Samvâdis; the latter being pairs of notes a fourth or a fifth apart which determined the tonality or harmonic structure of the scale. After the Jâtis came the Grâma-Râgas, which may be regarded as generic melody-types, and their descendants the *Râgas* of modern India. The best singers in India, those whose art has not been contaminated by the tempered harmonium, prefer to sing to an accompaniment of the tambura alone, or the tambura with drums. The *tambura* is a stringed instrument of rich tone upon which a powerful drone is produced consisting in almost all cases of the fundamental note, which Europeans would be inclined at first to call the "tonic," and its fifth. With such an accompaniment it would be next to impossible for any singer with a sensitive ear to sing the first five notes of the ordinary major-scale in anything but just tuning, unless he departed therefrom of set purpose, for the fifth upper partial tone of the bass is to be heard distinctly, and the third upper partial of the fifth above. Wherefore the use of the tambura is to be recommended for the singer of Folk-songs also, unless a harmonized accompaniment in natural tones is to be obtained. To proceed, the Indian singer will always be able to state in what Râga or Râgas his song is composed. The name of the *Râga* connotes a scale bearing a fixed relationship to the drone, with its harmonic structure determined by a Vâdi and Samvâdi, a chief note ("ansha svara") occurring more frequently than others, a lower limit described in terms of the Murchhana, occasionally an upper limit also, certain characteristic turns of melody,

recurring with frequency, certain rules regarding the employment of embellishments, and a stated time of the day for its performance. It is a common practice, after singing an air in a Râga, to improvise a series of free fantasia passages, each returning in due course to a characteristic snatch of the melody, only to wander off again in still more elaborate variations. The whole performance must be "within the Râga," that is, without transgression of the elaborate rules governing its structure.

Scope of the present work.

Until recently, with trifling exceptions, Râgas, with their rules and scales and compositions, were handed down from teacher to pupil without the aid of any written record. It is not surprising, therefore, that a good deal should have been lost, and that different singers should be at sixes and sevens regarding the names and distinguishing features of the Râgas. Various investigators have made compilations with the intention of making known the scales used in various Râgas. These compilations are useless to the present writer, because they one and all ignore the "hair's breadth" distinctions upon which correct intonation depends. The present work does not essay to give a list of Râgas or scales, but merely to point out a method by which they may be classified. Where the reader may have any criticism to offer regarding the scales given as examples, and the names attached to them, he should remember that they are taken, with one or two exceptions, from the répertoire of one artist, Abdul Karim. The author is aware that in some cases other singers employ other scales or sing the same scales under other names. The reader should also understand that, as an introduction to the study of Indian music, this book does not go beyond the province of intonation. Once a census of Indian Râgas is made, and once their scales are classified into groups according to the principles of correct intonation, their further subdivision according to harmonic structure, as determined by the "Nyâs Svara" (final note), and Vâdi and Samvâdi, may be undertaken. With the material at present available it is impossible to make any suggestions as to the manner of proceeding with such further subdivision.

From ancient times up to a comparatively modern date,

the notes or "svaras" which, strung together, constituted the Grâmas were called "*shuddh*," which means "pure." In the modes or Jâtis of each Grâma certain chromatic variations in the notes were used for the sake of melodic effect. The notes so altered were called "*vikrit*." The name "vikrit" was extended to any new note obtained by shifting the frets of the solo instruments in use, such as the vîṇa and sitâr. Various tuning devices for a change of mode involving a shifting of the frets without retuning the chanterelle or drone strings came to be employed. A great deal of discussion has centred round these "shuddh" and "vikrit" notes, but for the most part it has been infructuous because the looseness and inaccuracy of the term "vikrit" has not been sufficiently grasped.

The shuddh and vikrit notes.

The ancients believed that if the octave were divided into twenty-two roughly equal parts all the notes in use could be obtained. They called these small intervals "*srutis*," and spoke of intervals of two srutis, three srutis, and four srutis, and of raising or lowering a note by one sruti or more. They believed that all the "shuddh" and "vikrit" notes had srutis to themselves. The author concludes, from a study of Bharata's Nâtya Shâstra and the Sangit Ratnâkar of Sârangdev, that their system in reality involved the use of 25 notes to the octave, and not 22 as they imagined (see Appendix E).

The srutis.

Their theories were founded upon the system of tuning described as confined to Hindustân in Captain Day's "Music of Southern India" (p. 109). In that system the chanterelle strings were dhaivat, rishabh, and gândhâra. This is a conclusion which one cannot fail to draw from a careful study of their textbooks. Now, the modern system of tuning throughout India has shadj as the principal drone, accompanied by pancham or madhyam. Not only this, but shadj and pancham are regarded as fixed notes which may never become "vikrit," or, in other words, sharpened or flattened, and shadj has acquired the privilege of being regarded as the basis of all scales. All Jâtis, therefore, start from Shadj, and all the scales of all the Râgas.

The old tuning method now obsolete.

It is clear, therefore, first that the modern srutis and the

ancient srutis must differ in many cases, and, secondly, that there are no longer strings of shuddh notes from which to construct Jâtis and scales of Râgas. This latter conclusion, which there is no gainsaying, has escaped the notice of all writers on the subject. In practice it has been recognized by some of the Hindustani musicians, who accordingly discard the word "shuddh" except in the case of sâ and pa, and call the other notes atikomal, komal, madhya, or madhya-tivra, tivra, tartivra, according to their position in the scale. The author follows their practice in this respect.

Ancient terminology no longer appropriate.

Until Mr. K. B. Deval, a retired deputy collector, residing at Sangli in the Southern Maratha Country, commenced his researches, the subject of Indian intonation had baffled all inquirers. Many books had been written by Indian gentlemen and others with the laudable object of explaining what Indian music was, but the European in India, who was interested in the subject, found that there was a point beyond which he could not go. Mr. Deval constructed a diachord consisting of two wires of equal length stretched over a sounding board, one wire being provided with a graduated scale and a movable fret of the same height as itself. His method was to tune both wires to the same pitch, that of the shadj of the singer assisting him. He moved the fret of the wire which had the graduated scale into the position which gave the note which the singer had been asked to sing. A simple calculation from the reading of the scale gave him the comparative vibration-number of the given note in relation to shadj. He persevered for years at this investigation, deriving assistance from many of the best singers that India could produce. As egards most of the notes in use, his conclusions, when referred back to ancient theory, may be summed up in the statement that two srutis make a just semitone, three srutis a minor-tone, and four srutis a major-tone. In respect of these notes the accuracy of his conclusions can fairly be said to be beyond controversy. The remaining notes belong to certain irregular scales; a knowledge of the melodic structure of the Râgas in which they are employed was called in

Mr. Deval's researches and the Indian harmonium.

to assist the verification upon the diachord. Mr. Deval published his conclusions in "The Hindu Musical Scale and the Twenty-two Srutees," printed at the Arya Bhushan Press, Poona. The next step was to order a harmonium tuned in the twenty-two intervals which he termed the "twenty-two srutees" of the "Hindu Musical Scale." This instrument was designed by Mr. H. Keatley Moore, B.A., Mus. Bac., who assisted the late Mr. A. J. Ellis in the latter's translation of Helmholtz' "Sensations of Tone." After some slight modification in tuning and the arrangement of the keys, the result of verification and experience, the instrument has been patented (15548/11); the manufacturers are Messrs. Moore & Moore of New Oxford St., London (the makers of Ellis' Harmonical), and the agents in India are Messrs. S. Rose & Co., Bombay. The author has, through Mr. Deval's courtesy, and with the help of Abdul Karim and other singers, been able to verify all the various scales mentioned in the following pages upon this instrument.

The following table describes the twenty-four notes in most frequent use, showing which of them are adopted in the Indian harmonium, and their relationship with the ancient srutis.

Description of terminology here adopted.

Numbers and names of the Ancient Srutis.	The more common of the Modern Srutis: in what Râgas used. Moore's harmonium notes numbered in brackets.	European equivalents, Shadj being F.	Signs.	Comparative vibration number, sâ being taken for convenience of calculation to be 240.
0. Kshobhini	(0) Nishâd komal[1] (Kâfi, Khar âj)	Low E♭	ni 𝄫	213⅓
1. Tivra	(1) Nishâd kaishik[1] (Bahiravi)	E♭	ni♭	216
2. Kumudvati	(2) Nishâd tivra[1] (Kalyân)	E	ni♮	225
3. Manda	(3) *Nishâd tartivra* (Mârvâ)	*F♭*	*ni𝄬*	*227½*
4. Chhandovati	(4) Shadj[1]	F	sâ	240
5. Dayâvati	(5) Rishabh atikomal ("Septimal" Asâvari)	Septimal G♭	ri 𝄬	252

NOTE.—The names of Ragâs are merely given as a help towards identification.

[1] The modern Srutis, marked with a figure [1], are identical with the ancient Srutis of the same serial number. This will be seen in a later chapter.

Numbers and names of the Ancient Srutis.	The more common of the Modern Srutis: in what Râgas used. Moore's harmonium notes numbered in brackets.	European equivalents, Shadj being F.	Sign.	Comparative vibration number, sâ being taken for convenience of calculation to be 240.
6. Ranjani	(6) Rishabh komal[1] (Bahiravi)	G♭	ri♭	256
7. Raktikâ	(7) Rishabh madhya[1] (Kâfi, Deshkâr)	Low G	ri 𝄲	266⅔
8. Raudri	(8) Rishabh tivra[1] (Kalyân, Asâvari)	G	ri ♮	270
9. Krodhâ	(9) Gândhâra komal[2] (Kâfi, Todi)	Low A♭	ga 𝄢	284⅘
10. Vajrikâ	(10) Gândhâra sâdhâran[2] (Bahiravi)	A♭	ga♭	288
11. Prasârini	(11) Gândhâra tivra[1] (Kalyân)	A	ga ♯	300
12. Priti	(12) Gândhâra tartivra (Jayjayvanti)	High A	ga 𝄪	303⅗
	Madhyam atikomal[2] (Yaman-Kalyân)	B♭ Septimal	ma 𝄬	315
13. Mârjani	(13) Madhyam komal[1] (Kâfi, Bahiravi, Bihâg)	Low B♭	ma 𝄢	320
14. Kshiti	(14) Madhyam kaishik (Dhâni)	B♭	ma♭	324
15. Raktâ	(15) Madhyam tivra (Kalyân)	B	ma ♯	337½
16. Sandipani	(16) Madhyam tartivra (Mârvâ)	C♭	ma 𝄪	341⅓
17. Alâpini	(17) Pancham[1] (Kalyân, Bahiravi)	C	pa	360
18. Madanti	(18) Dhaivat atikomal ("septimal" Asâvari, Todi)	Septimal D♭	dha 𝄬	378
19. Rohini	(19) Dhaivat komal[1] (Bahiravi)	D♭	dha♭	384
20. Ramyâ	(20) Dhaivat madhya[1] (Kâfi, Bilâval, Mârvâ)	Low D	dha ♮	400
21. Ugrâ	(21) Dhaivat tivra[1] (Kalyân, Bihâg)	D	dha ♯	405
	Nishâd atikomal	Septimal E♭	ni 𝄬	420
22. Kshobhini	(22) Nishâd komal[1] (Kâfi, Khamâj)	Low E♭	ni 𝄢	426⅔

It is a lamentable fact that there is no uniform system of naming the Indian notes. The difficulty which confronted the author was to put distinctive names to srutis, which although

[1] See note 1, previous page.

[2] If C on Moore's harmonium is taken as sâ, the stud marked 𝄫 (*i.e.* in key pancham) gives atikomal ma. It was found impossible to include this note in key F.

invariably distinguished in practice, are generally confounded under the same name. Such is the case with numbers 7, 8, and 20, 21 of the above. The name madhya or madhya-tivra is used by Abdul Karim to distinguish the lower of the two notes, and the practice being generally acceptable is here adopted. With regard to the groups 0, 1 and 9, 10 and 13, 14 more difficulty was experienced. The last (No. 14) has never hitherto been differentiated in name from the note below. The following table will show at a glance what justification the author has for adopting the names above given.

Srutis.		Ancient names.	Names obtaining in Madras.	Names obtaining in Hindustan.		Names here adopted.
				First Method.	Second Method.	
0 1	ni 𝄢 ni♭	Shuddh Kaishik	Kaishik	Komal	Atikomal Komal	Komal Kaishik
9 10	ga 𝄢 ga♭	Shuddh Sâdhâran	Sâdhâran	Komal	Atikomal Komal	Komal Sâdhâran

The confusion of nomenclature displayed in Southern India and for the most part in Hindustan is a heritage from the change of tuning discussed in later chapters. Atikomal for ni 𝄢 and ga 𝄢 will be felt to be a misnomer by any one acquainted with the other atikomal notes. It is an absurdity to call the principal notes of Râga Kâfi or Sri-Râga by such a name, notes which originally formed the basis of the Shuddh Jâtis. They are no more atikomal than ma 𝄢 which is universally called either komal or shuddh. The author distinguishes ma 𝄢 and ma♭ on the analogy of the corresponding srutis of nishâd. The distinction between ga 𝄢 and ga♭ is of precisely the same nature, and the name kaishik for ga♭ would be appropriate, were it not for the fact that the note has for centuries been called sâdhâran ga.

It can hardly be disputed that the twenty-two notes chosen as the basis of tuning of the Indian harmonium are the commonest of the Indian notes. It must be remembered that in calling them the twenty-two srutis of modern Indian music, one is using the word *sruti* in a transferred sense, for strictly speaking a sruti is an interval and not a note.

Secondly, the orthodox ancient system regarded shadj (and other notes also) as of fixed absolute pitch, the pitch of each shuddh note being referable to the cry of some animal or the note of a certain bird Although some singers of the present day follow the ancient theory in this respect and have their own inflexible notion as to the proper pitch of shadj, the usual custom is to take any pitch that is convenient to the singer or performer. Thus the term sruti has been made to depart from its original meaning in two directions.

It will be useful to tabulate the notes employed in the Indian harmonium thus—

Name of note as abbreviated in singing.	Middle row of studs, marked "ak" and "k."	Black keys.	Front row of studs marked "m."	White keys.	Back row of studs marked "tt."
Sâ	–	—	—	Shuddh	—
Ri	Atikomal ♭	Komal ♭	Madhya ♮	Tivra ♯	—
Ga	Komal 𝄫	Sâdhâran ♭	—	Tivra ♯	Tartivra ♮
Ma	Komal 𝄫	Kaishik ♭	—	Tivra ♯	Tartivra ♮
Pa	—	—	—	Shuddh	—
Dha	Atikomal ♭	Komal ♭	Madhya ♮	Tivra ♯	—
Ni	Komal 𝄫	Kaishik ♭	—	Tivra ♯	Tartivra ♮

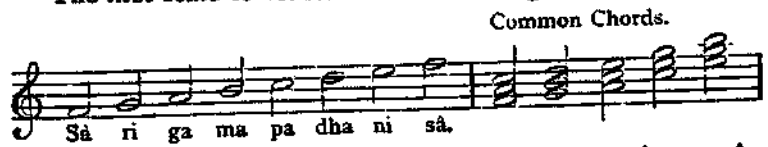
Brief explanation of the notation employed.

The rest of this chapter will be taken up with a brief account of these twenty-two notes and their distribution among the commoner Indian scales. This account is intended for the European reader who presumably has some acquaintance with the theory and notation of Western music; others are referred to the more detailed explanation to be found in the next chapter.

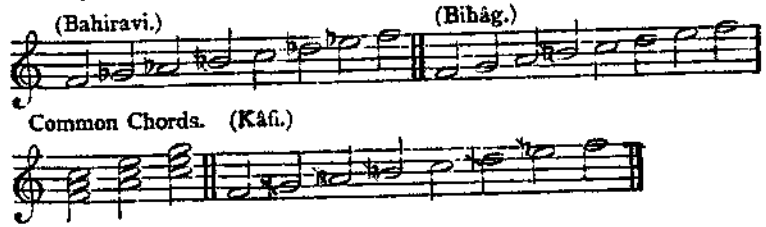
In the Indian harmonium, shadj has been given the pitch of F (Philharmonic, 1896); apart from that circumstance, the notation to be employed has absolutely no connection with any key or pitch. Shadj, which may be defined as the bass note of the drone in modern music, is represented as F for convenience, and the two F's of the treble clef encompass

the middle register of all voices from soprano to bass. The word "register" is here used in place of the Indian "saptak"; the Indian musician divides the compass of all human voices into three "saptaks," or octaves, the middle one naturally being the one most frequently in evidence. The signs used above represent respectively—(1) ♭ a septimal flat, the true harmonic seventh of the note on the black key next above; (2) 𝄫 a low flat, derived in a descending series of perfect fifths from sâ, thus ma 𝄫 is a fifth below sâ, ni 𝄫 a fifth below ma 𝄫, and ga 𝄫 a fifth below ni 𝄫; (3) ♭ a flat, ri ♭ being a major-third below ma 𝄫, and the rest related to ri ♭ by an ascending series of perfect fifths; (4) ♮ a low natural, ri ♮ and dha ♮ being in tune with ma 𝄫; (5) ♯ a natural in just tuning, the intervals being referred to the scale of pa (or C) major; (6) ♮ a high natural in the case of ga ♮, which is a fifth above dha ♯, and respectively pa ♭ and sâ ♭ in the other two cases.

The first scale to consider is that of Râga Yaman—



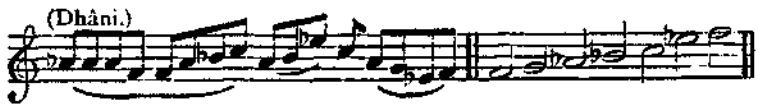
Here, sâ and pa are shuddh, and the rest tivra. As usual, the sign ♯ is omitted. In order to facilitate explanation, the position on the Indian harmonium keyboard will be considered; that is to say, the above scale will be taken to be actually from F to F. It will be noticed that the tuning is just tuning in the key of C major. D, F and D, A are not in tune; C to D, F to G, A to B are major-tones; D to E and G to A minor-tones; and E to F and B to C just semitones. In the following scales (in all Indian scales, in fact) the positions of sâ, ri, ga, etc., on the lines and spaces are exactly the same as above.



The first (Bahiravi) is a mode of the scale just described. E to E in the Yaman scale has the same intervals in the same order. Here ri and dha and ma are komal, ga sâdhâran, ni kaishik. The Bihâg scale is that of Yaman with the flat fourth. It differs from F major in just tuning in this respect, that the sixth being high (or Pythagorean) the number of common chords available is reduced to three. The Kâfi scale is the mode of its second; in other words, corresponds to the scale G to G in Bihâg. The Kâfi scale, therefore, has only three common chords. The notes used in Kâfi are ri and dha madhya, ga, ma, ni komal.

The above are what might be termed "diatonic" scales; the first two belong to the Madhyam Grâma, like the European major-scale in just tuning, while the last two belong to the Shadj Grâma.[1] It will be noticed that as many as sixteen different srutis are comprised in them.

The following passage is also of a "diatonic" nature; it introduces the high flat fourth (ma kaishik):—



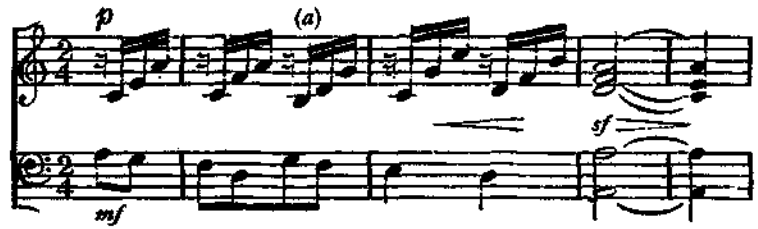
The scale which is given on the right is hexatonic. Adding dha ♭ (D ♭) makes it a mode of the Yaman scale, corresponding to the mode of the sixth of A ♭ major in just tuning. This scale will have five common chords.

This finishes the notes comprised in the "diatonic" or Grâma-scales. The reader who is only acquainted with equal temperament may find it hard to realize that the D in tune with F, and the D in tune with G, to take an example, are notes separated by an interval ($\frac{81}{80}$), which any untrained ear can appreciate and which can even be committed to memory and reproduced vocally. The accidentals above, which include a downward stroke (♮, 𝄫), in all cases mean a flattening by this interval, the interval which separates the minor-tone from the major-tone.

[1] The use of the high sixth instead of the harmonic sixth in what may be loosely termed the parent scale makes the difference between the two grâmas. The gramas are fully explained in the next chapter.

The difference between just tuning and temperament is well illustrated, not only in the Indian Râgas, but in the treatment accorded to Folk-songs by modern musicians. If it is not practicable to accompany Folk-songs with just harmonies, one would think that it might at least be advisable to write an accompaniment which could be played upon an instrument in just tuning if such were to be had. This, however, is not the course usually adopted. The compiler of collections of Folk-songs, instead of ascertaining the chords in just tuning which are available to him, trusts to a vague musical instinct, with results of which the following is an example—

European Folk-song music.

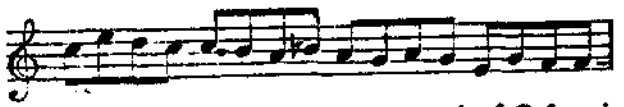


In the Folk-song to which this is an introduction (No. 5 at p. 13, of "Trente Mélodies Populaires de Grece et d'Orient," by M. Bourgault Ducoudray), the "final" is A and the "dominant" D, that is to say, low D (D ♮), the note a fourth above A. It is an error, in the chord marked (*a*), to make D harmonize with G, unless just tuning is entirely disregarded. To put the matter in another way the D used in the G chord is not in the mode. In the ame way, in the next number, at the thirty-fifth bar, a foreign chord is introduced. Similar examples might be multiplied; they are to be found in many such collections.

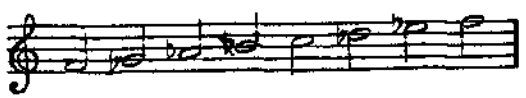
The reader is referred to the next chapter for a full explanation of the tartivra notes in connection with the scales of Râgas Mârvâ, and Jayjayvanti. Whether the view there suggested regarding the development of septimal harmonies from the chromatic scales is correct, admits of considerable discussion. Septimal intervals may be an addition for which the Hindu people should be thankful to the Mahommedans. Harmonically they add considerable charm to the Indian Râgas, and

Explanation of notation continued.

this short sketch of the modern Indian srutis would be incomplete without some account of them. The following passage from the Râga Yaman-Kalyân introduces an atikomal note which it was found impossible to incorporate in the Indian harmonium—



The eighth note is the harmonic seventh of C, forming the interval $\frac{7}{4}$ with the middle C, and $\frac{21}{20}$ with A. *Those unacquainted* with the natural intervals would be surprised at the large interval separating this note from the ordinary B flat (B ♭). As the Indian name atikomal implies, the note is very flat indeed. The atikomal ri and dha of the following scale, taken from a Râga which Abdul Karim call Asâvari, belong to the same class—



An atikomal ga and an atikomal ni of similar description are employed in some rare Râgas. A low ga, the very slightest degree lower than ga tivra, making the interval $\frac{7}{6}$ with ri ♭ is also occasionally employed. The well-trained Indian singer is thoroughly conversant with septimal intervals and intones them with accuracy and without hesitation.

The number of irregular scales employed by different singers is considerable, and modern Indian musicians, with pardonable exaggeration, describe the srutis they sing as "anant" or endless. In the following chapter will be found a note regarding the extent to which it is possible to discuss these rare scales and intervals in the present work.

CHAPTER II

THE STAFF NOTATION AND THE SRUTIS

THE purpose of this chapter is to give an account, fuller than the sketch given above, of the manner in which the various notes or srutis in use in Indian Râgas may be represented in an adaptation of the staff notation of Europe.

For the sake of those who are not thoroughly conversant with the scientific side of the subject, it will be advisable to explain as briefly as possible what is meant by the harmonic series and by natural and tempered intervals.

The sensation of sound is due to vibrations of the air. A musical note is distinguished by the regularity of the vibrations of which it is composed. Strictly speaking, a musical sound defined by a certain number of vibrations per second should be denominated a "tone." In order to avoid ambiguity, however, the author uses the word "note" for the purpose. The original meaning of "note" was the sign in notation by which a tone was expressed; in common parlance it has also the meaning which is here assigned to it. The interval, or "distance" as Bharata has it, between two notes is completely defined by the ratio which their vibration-numbers bear to each other. It follows that in order to obtain the sum of two intervals, one must multiply their ratios; and to obtain the interval *which constitutes* the difference between them, one must divide the bigger ratio by the less.

The measurement of Musical intervals by ratios.

The notes of stretched strings and of many other musical instruments are clothed in upper partial tones or harmonics; it is this circumstance which gives them their "timbre" or quality. It is a general law that if the tension of a stretched string is constant and notes are sounded upon different lengths of it (this may be

The Harmonic Series.

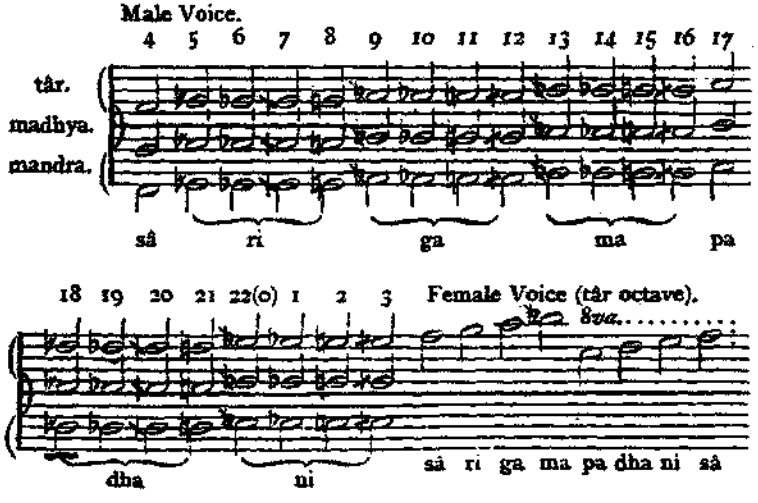
done by means of the device adopted by Mr. Deval in his diachord, namely, adjusting a movable fret of the same height as the string at the required distance, pressing the string lightly upon the fret, and plucking the string upon the side adjusted to the given length), the vibration-numbers of those notes will be inversely proportional to the length of string required to produce them. Thus, if the whole string gave a note of 100 vibrations a second, $\frac{2}{3}$ of the string would give a note of 150 vibrations a second. The upper partial tones which enrich a note are thus explained:—The primary note which the ear recognizes is that given by the vibrating length of string as a whole. A plucked string, however, vibrates not only in its whole length, but in nodal segments corresponding to the fractions of the harmonic series, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, etc. Hence, together with the primary note of, say, n vibrations a second, are faintly sounded a long series of notes of vibration-numbers represented by $2n$, $3n$, $4n$, $5n$, $6n$, etc. In the notes of the tambura, these upper partial tones are so strong that the untrained ear may easily recognize them as far as the fifth member of the series. The series of notes formed by the generator and its upper partial tones is commonly called the harmonic series. To the student of the Indian scales a knowledge of it is essential, as all the melodic intervals which the musicians of ancient Hindustan thought beautiful and worth preserving are traceable ultimately to its influence.

The Great Staff and the three Saptaks of Indian vocal music.

The staff-notation is a graphic method of writing music. It possesses a distinct advantage over any method which requires the eye to follow one set of signs for melody (svara), and an entirely distinct set for time (laya). The pitch of a note in staff-notation is shown by its position (*vertically*) on the staff, and the character of its accidental if any, its time value by the sign used, and its place in the measure (âvarta) by its position (*horizontally*) in the bar. This chapter deals only with the pitch of notes as shown by their vertical position; an uniform sign known as the minim (𝅗𝅥) will be used in every case.

The Indian system of vocal music allots three "Saptaks" or octaves to the voice, each Saptak ranging from sâ up to ni.

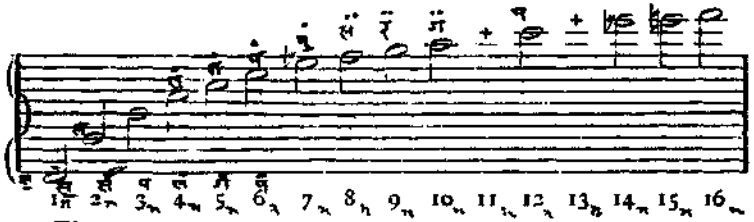
The lowest octave is called "mandra, the middle octave "madhya," and the highest "tar." The Great Staff consists of eleven lines, the middle one of which is thicker than the others. This middle line represents the middle C of the European keyboard. Other notes, above and below the middle C, are represented by spaces and lines alternately. Turning for a moment to the Indian harmonium, the shadj of which is primarily intended to be the F of European music (at the philharmonic pitch of 1896), the 22 srutis in the three octaves may be thus represented on the Great Staff:—



These are the twenty-two more common srutis of modern music, numbered according to the ancient system, in the three "saptaks" of the male voice. Played on the Indian harmonium at the pitch indicated by the Staff, they are correct in point of pitch according to the notions of the singer Abdul Karim. The soprano voice would be an octave higher according to Indian ideas. The madhya and târ saptaks would be the mandra and madhya saptaks respectively of the soprano. The soprano târ octave would be written as indicated, either using short or "leger" lines above the Staff, or using the dotted lines and sign 8va, which mean "to be sung or performed an octave higher."

The next example shows the relative pitch of the first sixteen of the harmonic series of the lowest sâ on the Great Staff. (As before brackets are used to show the three "saptaks.")

The Harmonic Series in Notation.



The 7th, 11th, 13th and 14th members of the series are not to be found among the keys of the Indian harmonium, the 13th is quite unknown to Indian music, so also is the 11th, unless, as stated in a later chapter, it formed part of the Gândhâra Grâma, while the 7th and its octave the 14th are the atikomal nishâd mentioned above (p. 8).

The use of the sign ♮.

It will be convenient to state at this point that it is proposed to borrow from European music the practice of using the sign ♮ only in cases where the note of the denomination in question has, when last used, borne a different accidental. For instance, the fifth, ninth, tenth of the series are tivra, but the accidental is dispensed with; the fifteenth bears an accidental, as the note immediately preceding it is also Nishâd and bears the accidental ♭. Thus, sâ and pa, being unchangeable, according to the modern view, will never require an accidental, while the tivra notes will only use their accidental ♮ in the circumstances explained.[1] In European music, the notes which require no accidental ordinarily and make use of the sign ♮ when necessary to distinguish them from preceding notes, are the notes of the scale of C major. The scale of C major in just tuning when played from F to F is identical with the scale of the Râga Yaman, which consists of sâ and pa shuddh, ri, ga, ma, dha and ni tivra.

Intervals given by the Harmonic Series.

As the vibration-numbers of the notes of the harmonic series are proportionate to their serial numbers, the series gives at once the ratios of the intervals employed in music. The intervals given by the first ten numbers of the series are in order, the

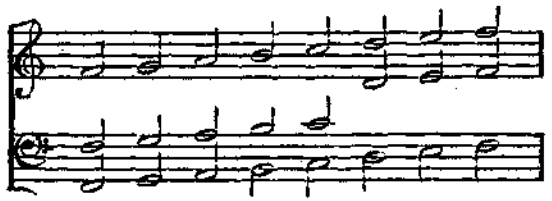
[1] See p. 43.

octave $\frac{2}{1}$, the fifth $\frac{3}{2}$, the fourth $\frac{4}{3}$, the major third $\frac{5}{4}$, the minor third $\frac{6}{5}$, the septimal third $\frac{7}{6}$,[1] the septimal tone $\frac{8}{7}$, the major tone $\frac{9}{8}$, the minor tone $\frac{10}{9}$. The 16th and 15th members give the semitone $\frac{16}{15}$. All Indian scales may be referred to some or other of these intervals. It is not suggested that scales were consciously built up upon such an elaborate foundation as the first sixteen terms of the harmonic series. The intervals given by the first five terms were sufficient for the construction of the early Hindu scales. If the two fifths, sâ to pa, pa to ri, be added together and the interval sâ to sâ or an octave be subtracted, the major tone sa to ri results. Thus $\frac{3}{2} \times \frac{3}{2} \div \frac{2}{1} = \frac{9}{8}$. Subtracting the major tone sâ to ri from the major third sâ to ga gives the minor tone ri to ga, $\frac{10}{9}$. The semitone $\frac{16}{15}$ is the difference between the fourth $\frac{4}{3}$ and the major third $\frac{5}{4}$. Another semitone, $\frac{21}{20}$, which may be termed the Septimal semitone, is obtained by subtracting the septimal tone $\frac{8}{7}$ from the minor third $\frac{6}{5}$. Septimal intervals appear to have been introduced at a comparatively modern period; they presuppose some kind of acquaintance with the seventh term of the harmonic series.

The Notation simplified.

In Appendix B will be found examples showing to what extent the notes of the harmonic series may be obtained from the Indian harmonium. The reader who has access to such an instrument will be interested to discover how harmoniously these notes blend together. The examples are written in Pianoforte Score, which consists of the Great Staff with the middle line omitted. This method will be found to give more facility for reading than the Great Staff; the omission of the central line gives greater prominence to the position of the notes. The Yaman Scale is here shown in the three octaves in Pianoforte Score. The upper staff is known as the Treble and the lower as the Bass; the signs used to distinguish them are called clefs.

[1] The author adopts these names as they are simple and appropriate, in preference to the cumbrous names at present used by European scientists.



For writing single melodies without accompaniment it will be unnecessary to use both the treble and bass clefs as here shown. The treble clef will be sufficient for the purpose, with the aid of the following simple convention, which is ordinarily followed in European vocal music. The melody will be written for the female voice; the male singer will sing an octave lower. The following will represent the mandra, madhya and târ octaves in the Yaman-scale for all voices.

If found more convenient, the lower and upper notes, instead of being written upon leger lines, may be written in the madhya octave, with the sign 8va... below or above respectively.

The Notation in reference to absolute pitch.

So far, this discussion has reference to Indian music written for the Indian harmonium in the principal key of that instrument. That key (F Philharmonic 1896 = Shadj) was chosen for two reasons—first, because one of the most proficient of Indian singers regards that as the correct absolute pitch of shadj; and secondly, because the key is the very one which anyone in search of the simplest possible notation for Indian music would unhesitatingly fix upon. For purely instrumental music, F will do as well as any other pitch; it will also suit a large number of voices. Difficulty arises only when a singer who finds F an inconvenient pitch wishes to accompany his voice in unison on the Indian harmonium or to learn from that instrument the correct intervals of any particular Râga. To meet these cases, Appendix C has been compiled. From the

typical scales there given it will be easy to pick out the correct notes of any Râga at approximately the pitch desired. The question of notation with regard to keyed instruments may be now put on one side, as, excepting the Indian harmonium, no keyed instrument capable of playing Indian music has yet been constructed.

For the vina, sitâr and other Indian instruments, and for the voice, it is not necessary that the notation shadj should be of any specific pitch. The notation last described is by far the best for two reasons. First, the Staff includes the madhya saptak completely and conveniently. Secondly, as modern Indian music allows no change in sâ or pa, F sharp or C sharp will never be employed; a slight acquaintance with the Indian system teaches one also that no other sharps are in use; consequently, the notation will dispense with the sign ♯, which is used for a sharp note.[1]

The Notation finally chosen.

In the notation followed throughout this book the treble clef will be used, the lowest space being appropriated to sâ of the madhya saptak, and the top line to the sâ of the târ saptak. Except in connection with the Indian harmonium no element of absolute pitch is to be associated with it.

Scales and Srutis defined.

A suitable notation having been found, the next step will be to examine certain typical Indian scales which between them furnish all the 22 notes set out above on the Great Staff. To avoid misapprehension, it will be advisable to premiss that a scale is a collection of notes ranging from a given note to the note an octave above and resembling a ladder in this respect, that the array ("thât") of notes must afford a practical means of ascent and descent. To describe the 22 srutis above given, or the collection of Shuddh and Vikrit notes given in the Sangit Ratnâkar, as a "chromatic scale" is a misnomer. The European chromatic scale of twelve semitones stands upon a different footing, as chromatic passages taken from it are employed in music. Then, again, it is an error to suppose that the 12 srutis were ever pieced together by fitting small

[1] It is a common practice to put sâ on the line appropriated to C. This renders the use of the accidental ♯ necessary for ma tivra. The scale of C is also an awkward one for passages in the mandra octave.

harmonic intervals between the fundamental note and its octave. The ancient theorists of India had no knowledge of harmonic ratios; to them the interval termed a sruti appeared to be the smallest interval which the human voice was capable of singing, consequently, they assumed roughly that their 22 srutis divided the octave into equal parts. Recent research has, however, made it abundantly clear that the direct descendants of the ancient intervals of four srutis, three srutis and two srutis, are respectively, the major-tone ($\frac{9}{8}$), the minor-tone ($\frac{10}{9}$) and the semitone ($\frac{16}{15}$). One is therefore justified in assuming that these were also the ancient intervals. It will be found in later chapters that this postulate is of assistance in unraveling the meaning of the old text-books. Now, the sruti between four srutis and three srutis is $\frac{81}{80}$, while that which lies between the latter interval and the semitone is $\frac{25}{24}$. So long as it is understood that the srutis were never equal, no great object is gained by measuring them individually. It was, however, a convenient terminology, and still is so, to distinguish the major-tone, minor-tone and semitone by the number of srutis they contain. The twenty-two notes adopted in the Indian harmonium have this merit, that they conform in this respect to ancient usage; it will be found that every major-tone obtainable from them consists of four srutis,[1] every minor-tone of three srutis, and every semitone of two srutis.

The Grâmas and Jâtis of the ancient system.

It is impossible to grasp the facts of Indian intonation without a knowledge of the two principal Grâmas, the Shadj Grâma and the Madhyam Grâma. The Gândhâra Grâma is not in use, and need not be discussed here; but it is a mistake to suppose that the other two Grâmas are also to be regarded merely as objects of antiquarian interest. Writers who treat of the Greek modes and the Church modes, and composers who make collections of Folk-songs, generally fail to take adequate notice of this fundamental branch of intonation. The same tendency is unfortunately at work in India. The ancient Indian theory was based upon two collections of notes, or "svaras," known as Grâmas. They differed in this respect, that the pancham was in one flatter

[1] There are two exceptions: the major-tone between srutis 3 and 6, and srutis 16 and 19; but these intervals are rarely used, if at all.

by one sruti. Until one of the notes was chosen as a starting-point, they were Grâmas and nothing more; the lowest note being chosen to sing from, a Murchhana named after that note was produced. For a scale or mode which was to become the basis of a musical composition more was required, namely, the harmonic relationship given by the Vâdi and Samvâdi, and the stability given by a fixed initial note (Graha) and final note (Nyâs). The initial note appears also to have been the drone or pedal note. The Vâdi and Samvâdi corresponded very nearly to the final and dominant of the Church modes; they were invariably a fifth or a fourth apart (never a third as in some of the Plagal modes), and, as alternative Vâdis and Samvâdis were allotted to each Jâti, it is probable that a kind of modulation was allowed, this being more permissible in a system which required a constant fixed drone accompaniment. The simplest modes formed upon the plan thus briefly described were called "Shuddh Jâtis." There was one for every degree of the scale; the "Shuddh Jâtis" were distinguished from others in having the initial and final and chief note, or prevailing note of a composition, the same as the "nâma-svara," or that note which gave its name to the Jâti; of the seven Shuddh Jâtis, four belonged to the Shadj Grâma and three to the Madhyam Grâma. As a knowledge of the Shuddh Jâtis is of great assistance o the student of the Indian scales, they are here given, first in their primitive form, and then in their modern position, based upon shadj; it will be observed that their names are derived from those of the initial notes. The sruti-intervals between the different degrees are shown in each case in figures.

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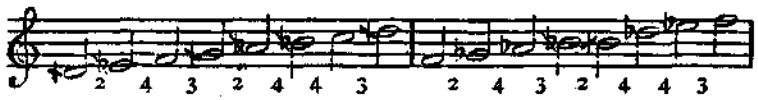
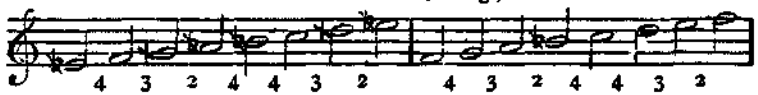
THE SHADJ GRÂMA.

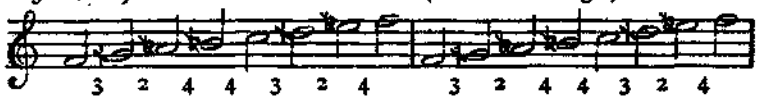
1. Dhaivati.



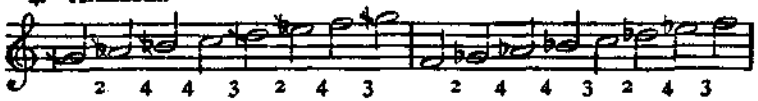
2. Naishâdi. (Bihâg.)



3. Shâdji. (Kâfi or Sri-Râga.)

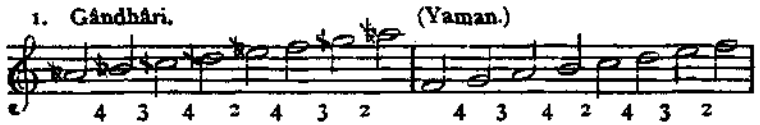


4. Arshabhi.[1]

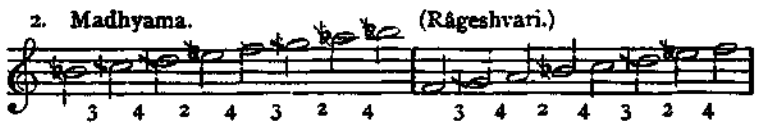


THE MADHYAM GRÂMA.

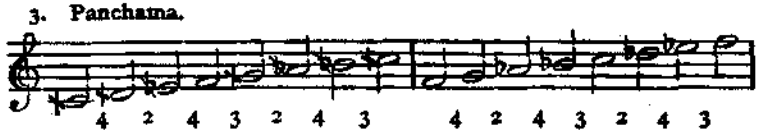
1. Gândhâri. (Yaman.)



2. Madhyama. (Râgeshvari.)



3. Panchama.

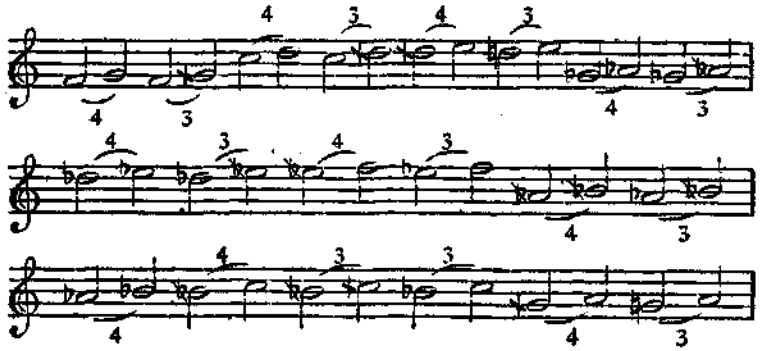


Explanation of accidentals and comparison of the two Grâmas.

The following quotation from Bharata (Nâtya Shâstra, Ch. 28, Commentary on verse 25) may serve as a text upon which to hang an explanation of the bewildering number of accidentals used: "Pa is lowered one sruti in the Madhyam Grâma. The interval passed over in raising or lowering pa by one sruti is the measure of a sruti." Although

[1] If the text of the Sangit Ratnâkar is followed literally, the scale here given would be in the higher or târ octave, the usual (madhya) octave being an octave lower.

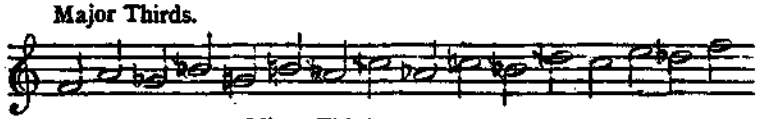
the interval of two srutis is not double that of one sruti, nor the interval of four srutis double that of two, although in fact Bharata and his successors laboured under a misapprehension in considering that the sruti was a unit by which intervals could be exactly measured, yet the Indian musician had, and still has, a definite idea of what he means when he says a note is lowered or raised by a sruti. His idea of a sruti is $\frac{81}{80}$, the difference between the major tone and minor tone. The descending line used in the accidentals ♭ and ♮ always implies a descent by this interval of $\frac{81}{80}$. To make this clear the following collection of major tones and minor tones is given :—



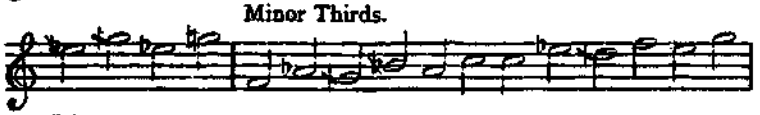
The figure 4 denotes a four-sruti interval, and 3 a three-sruti interval. The tivra sign is used in the manner above explained.

To enable the reader to distinguish with facility the consonant intervals of 7 srutis (the major-third, $\frac{5}{4}$) and 6 srutis (the minor-third, $\frac{6}{5}$) from the discordant intervals of 8 srutis ($\frac{32}{27}$) and 5 srutis ($\frac{32}{27}$), the following collection of intervals should prove useful :—

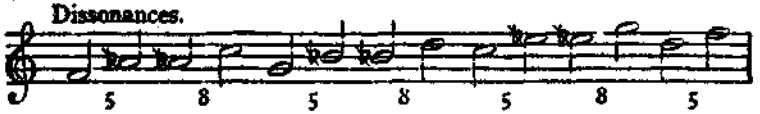
Major Thirds.



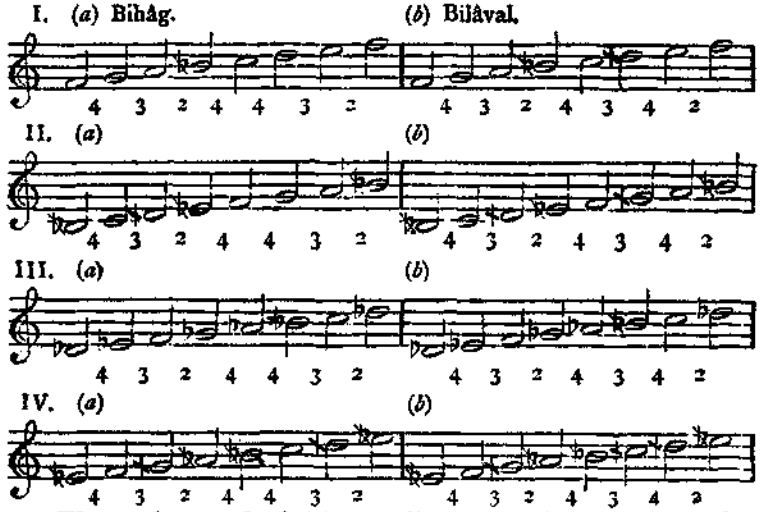
Minor Thirds.



Dissonances.

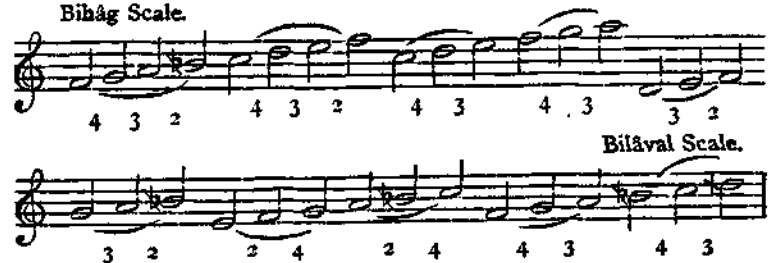


The Indian reader is probably familiar with the scales of Râgas Bihâg and Bilâval, although he may not perhaps have realized that the dhaivat of the latter is one sruti lower; the notes of Bihâg are sâ and pa shuddh, ma komal, and the rest tivra, while those of Bilâval have dhaivat madhya (♮) instead of tivra (♯). These two scales are here given side by side, first starting from shadj, and then in three transpositions from ma ♮, dha ♭ and ni ♮ respectively. The intervals are shown in srutis as before.



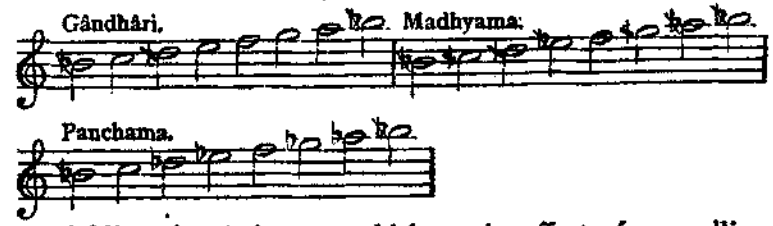
The scales marked (*a*) are all exactly the same; to also are those marked (*b*). The effect of lowering the sixth note in the (*b*) class is to change the harmonic structure of the scale. The sixth note, from being merely a relation (or in harmony with) the second, is transformed into a relation of the first and fourth notes of the scale. In Bilâval, for instance, dhaivat harmonizes as a minor third below sâ and a major third above madhyam; whereas in Bihâg it is discordant with both sâ and ma, and a fifth above ri. Scale II. (*b*) introduces the madhya rishabh, the note which is used with such telling effect in Deshkâr Râga. This note is in tune with ni ♮ and ma ♮, whereby it is to be distinguished from ri tivra. Scale III. (*a*) contains the high or "chadh" madhyam (ma ♭). This note is used in Dhâni Râga amongst others; it is a rare note in modern music, because the sâ drone strongly attracts

the perfect fourth (ma ♮). Scales IV. (*a*) and (*b*) are composed of the shuddh notes of the ancient Shadj and Madhyam Grâmas. It will be obvious that the flattening of pa by one sruti is precisely the same thing as the difference in harmonic structure which distinguishes Bilâval from Bihâg. Lest it should be supposed that because Indian music does not employ harmony in the Western manner, considerations drawn from the study of harmonic intervals are of less importance than in the West, the following scale passages which are divisible into groups (as shown by brackets) of identical harmonic structure, are taken from the scales under discussion. The laws of harmony have been, in the East as in the West, the chief determining factor in the evolution of musical scales.



Returning, after this digression, to the Shuddh Jâtis, the first remark one is inclined to make is that it is singular that so few of the modern scales are there. Three common scales, Bihâg, Kâfi, and Yaman, are comprised among the Jâtis, and one rarer one, Râgeshvari. It may be added as a possible explanation, that from Ratnâkar (Prakaran 4, verse 15)[1] it may perhaps be inferred that the Madhyam Grâma Jâtis should be taken from ma and not from sâ, thus—

The Jâtis and modern scales compared.

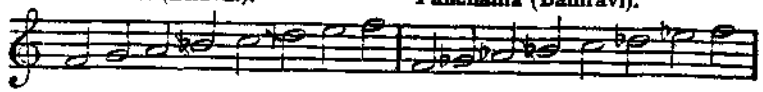


Adding the sâ drone would have the effect of compelling the ear to refer the scale to shadj as a starting-point. This gives for Gândhâri and Panchama, the following familiar

[1] See p. 58.

scales; but the Madhyama scale must be discarded, as modern practice does not allow a flattened pa.

Gândhâri (Bilâval). Panchama (Bahiravi).



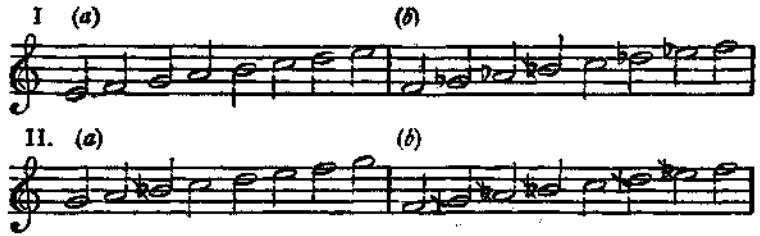
This method therefore gives five well-known scales in place of three. Yaman and Kalyân may also have been derived from the Shuddh Jati Naishâdi by sharpening of the fourth, that is to say, by the not uncommon change from shuddh ga to antara ga, a change which will be fully explained later on. From the form of Panchama first given, the hexatonic scale of the uncommon Râga Dhâni, may have been derived. Dhaivati and Arshabhi must, however, be rejected, the former because the fifth note is really komal pancham and not to be tolerated nowadays in such a scale, and the latter because the high fourth is not now used except in the Râga Dhâni and possibly in some rare derivatives of the Râga Asâvari. The secret of these dissimilarities and anomalies will be explained more fully in later chapters. It lies in a difference of tuning. In olden practice the Chanterelle or drone strings were dha ♭ and ri ♭, and for convenience' sake all Jâtis were played from the pitch of one or the other of these two notes. The modern practice is to make sâ the chief pedal note, and to add above it pa or ma ♮ according to the nature of the scale. Assuming that, in the majority of ancient compositions, the scale was actually based upon ri ♭, the drone would be the fundamental note of the scale together with another note (dha ♭) a fourth below it; in other words, it would correspond to sâ over pa, whereas the modern practice is almost invariably to take the fifth as a drone, namely, pa upon sâ. If this radical change in the nature of the drone accompaniment did actually take place, it is sufficient to fully explain the discrepancies between the ancient and modern scales.

The use of the word "Grâma" in relation to modern music.

The next important observation to be made is that in modern music there are, strictly speaking, no Grâmas, although the difference between the two Grâmas is accurately exemplified in the scales of Bihâg and Bilâval. The history of the Indian scales may be divided into three periods, (1) the Grâma period, (2) the Transition period, (3) the Modern period. In the first, all scales were played from the shuddh notes of the Grâmas; in the second, in order to avoid changing the drone and re-tuning the tambura and drums, all scales were played from ri ♭ as a basis, but as far as possible the frets of the shuddh notes were employed, the wire being tuned up or down to bring the required initial note (graha svara) to the pitch of ri ♭; in the third, that is at the present time, all sense of the Grâmas has died out, shadj is looked upon as the starting-point of all scales, and the scales of the Râgas are regarded, with certain exceptions, as independent structures. Those exceptions, although of no great importance, are highly interesting. Yaman and Bahiravi, as has been seen, belong to the Madhyam Grâma, while Bihâg and Kâfi belong to the Shadj Grâma. This inter-relationship is exemplified in the common practice of playing these pairs of Râgas respectively from the same set of frets. Thus I. *a* below becomes I. *b* if the wire is tuned up by two srutis, and II. *a* becomes II. *b* if the wire is tuned down by four srutis.

I (*a*) (*b*)

II. (*a*) (*b*)



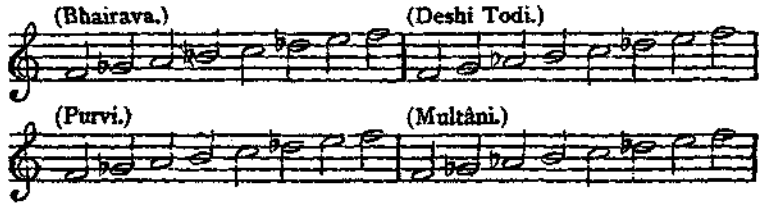
Indian music may be said, then, to have outgrown the Grâmas and the system of shuddh svaras. At the same time, a knowledge of the theory of the Grâma is essential to the student of Indian music, and the word Grâma itself should prove a useful substitute for the Western and less appropriate term "diatonic," to designate scales which are dorived from the shuddh notes of ancient India. The scales which have been discussed above may be referred to as the Grâma scales. They are distinguished from others by the fact that they contain three major-tones, two minor-tones, and two semitones.

In the music of Hindustan the Grâma scales hold the first place in point of number and popularity. Scales of less

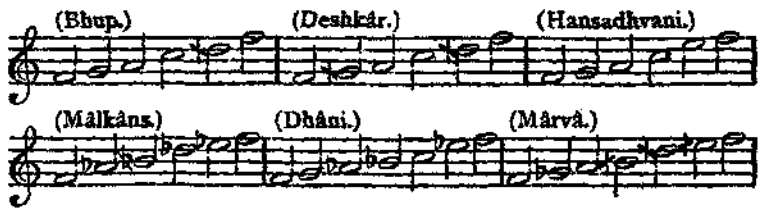
than seven notes, hexatonic or Shâdava, *i.e.* of six notes, and pentatonic or Odava, *i.e.* of five notes, may be regarded as abridgments of the complete scales to which they approximate. They will most of them be classed among the Grâma scales. Then came a very important class consisting of scales which comprise three or four semitones in place of two. Such scales are to be found also among the Folk-songs of Europe. They may not inappropriately be designated Chromatic scales. The following are examples of chromatic scales and transilient (hexatonic or pentatonic) scales :—

Scales other than Grâma scales.

CHROMATIC.



TRANSILIENT.

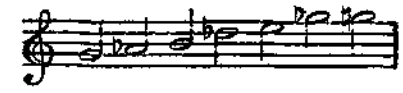


The names of the Râgas employing the scales given are written in brackets. The Bhup scale may be regarded as an abridgment of Bil val, that of Deshkâr as an abridgment of Kâfi with the sharpened or chromatic third, Hansadhvani as derived from Bihâg, and Mâlkâns from Bahiravi. The last two have an individuality of their own. Dhâni is a Grâma-scale, while Mârvâ is an irregular scale of a kind not hitherto discussed in this chapter.

Irregular scales.

The affinity of the Mârvâ scale to the Chromatic scales above given is disguised by the Indian notation, which treats the fourth and sixth notes as "tartivra," whereas, harmonically speaking, they are komal

notes. Tartivra ma, being a fourth above komal ri, should really be called komal pa, and tartivra ni similarly komal sâ. Indian tradition is, however, bound up with a "solfa," or "Sârigama" system which allots one of the names sâ, ri, ga, ma, etc., to the notes of all scales for the purposes of singing. It has become part of that tradition in comparatively modern times to restrict the names sâ and pa to two fixed degrees of the scale. The real character of Marvâ is made clear in the following transposition (beginning the scale from ri instead of sâ) :—



Respecting the intervals (other than semitones of two srutis) employed in the Chromatic scales, it will be found that the sruti system as a method of comparing them breaks down completely. The sruti system appears to have been applied in its inception to the Grâma scales only; when used in connection with other scales it leads to nothing but confusion. The intervals of the Bhairava scale expressed in ratios are—

$$\tfrac{16}{15},\ \tfrac{75}{64},\ \tfrac{16}{15},\ \tfrac{9}{8},\ \tfrac{16}{15},\ \tfrac{75}{64},\ \tfrac{16}{15},$$

while those of Mârvâ are—

$$\tfrac{16}{15},\ \tfrac{75}{64},\ \tfrac{256}{225},\ \tfrac{75}{64},\ \tfrac{256}{225},\ \tfrac{135}{128},$$

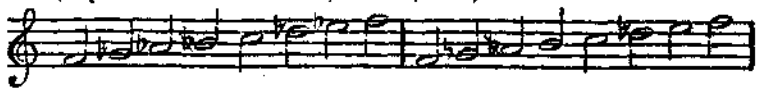
which approximate to

$$\tfrac{16}{15},\ \tfrac{7}{6},\ \tfrac{8}{7},\ \tfrac{7}{6},\ \tfrac{8}{7},\ \tfrac{135}{128},$$

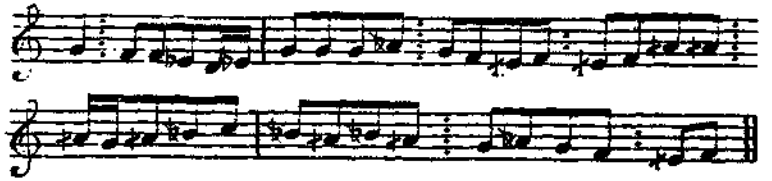
It may be that in this indirect manner, Indian musicians were led to incorporate septimal harmonics in their scales. Certain it is that in modern Indian music septimal intervals are employed with remarkable effect and in a considerable number of Râgas. There is a form of Asâvari which employs atikomal ri in place of tivra ri and atikomal dha in place of komal dha, a form of Todi which employs atikomal dha, and many others which there is no need to mention[1]:—

[1] Amongst them may be specially noticed the Râga Yaman-Kalyan, which employs occasionally atikomal ma, followed by tivra ga (interval, $\frac{25}{16}$). The scale of the common form of Âsâvari is sa, ri ♮, ga ♭; ma ♮, pa, dha ♭, ni ♭.

(Septimal form of Asâvari.) (Todi.)



Before leaving the Irregular scales, it will be of interest to give the following short passage in the Râga which the singer Abdul Karim calls Jayjayvanti—

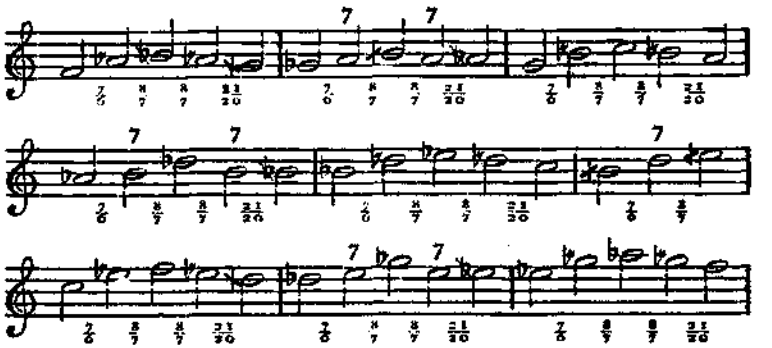


This example anticipates some features of the notation which are explained later on. To avoid misapprehension, the accidentals have been repeated before each note. The tartivra ni of Mârvâ is really komal sâ, as has been explained; the tartivra ga of this Râga bears approximately the same relationship to komal ma that the tartivra ni of Mârvâ does to sâ, but at the same time it is used frequently in conjunction with ri tivra and appears to be, harmonically speaking, what is known as high A, *i.e.* sharper than ga tivra by the interval $\frac{81}{80}$. It is possible to regard the tartivra ni of this Râga as "high E," instead of F ♭. The difference between these two notes is so small as to be hardly perceptible even to the trained ear of the Indian singer.

Irregular scales further discussed.

The reader may object that, as the above enumeration of the Indian srutis is admittedly not exhaustive, it is inadequate for the purpose in view. It is the writer's object, however, not to give a complete list of the Râgas known to any individual singer or singers, but to point out a method by which the scales of Râgas may be reduced to writing and classified. A slight consideration will show that all possible Grâma scales and Chromatic scales may be put together from the twenty-two srutis accepted in the Indian harmonium. The only ones omitted are those which depart from modern usage in having a flattened pa. It is only with regard to Irregular scales, therefore, that the above criticism has any force, and in their case it should be remembered that, although

the exuberant fancy of Indian composers has led to an extraordinary number and variety of scales, the Grâma scales and Chromatic scales greatly preponderate in point of universality and popular favour. Again, the Irregular scales, so far as the writer's experience goes, embody nothing new in principle, beyond the diminishing of the semitone exemplified in Jayjayvanti, and the use of the septimal intervals $\frac{7}{6}$, $\frac{8}{7}$ and $\frac{21}{20}$. It may be noted that the septimal diminished fifth ($\frac{7}{5}$) is apparently unknown to Indian musicians as a melodic interval. The possibilities opened up by these septimal harmonies are completely summed up below.[1] The figure 7 (above) signifies that the natural (or tivra) note on which it is placed is flattened in order to give a septimal interval.



The system of equal temperament.

Before concluding this chapter it will be convenient, now that the nature of harmonic intervals has been discussed, to show in what way they differ from the tempered tones and semitones of Europe. The European system of equal temperament is a modern creation; it originated in a desire to have unfettered liberty in the choice of keys and in modulating during the course of a composition from one key to another. For this purpose it was necessary that scales of exactly the same pattern should be available in every key. This object was attained by dividing the octave into twelve exactly equal intervals termed semitones. Instruments with fixed keys like

[1] The progressions avoided involve either a flattening of sâ or pa, or an incursion into "the sharp keys," both of which would be contrary to the genius of modern Indian music.

the organ, piano, and various wind instruments were constructed and tuned accordingly, and this artificial system has been assimilated to such an extent that singers and performers upon stringed instruments without frets such as the violin produce tempered music, in perfectly correct Intonation, without being aware in many cases that an element of artificiality enters into their performances. Indian airs and European Folk-songs, when sung without harmonized accompaniment in tempered notes, are exceedingly harsh; the addition of harmony tends to disguise the defective intonation, because the mind which grasps the harmonies intended has the capacity of correcting small errors. But the harmonizing of Folk-songs and of Indian Râgas in tempered harmonies can never be recommended, except by those whose acquaintance with natural intervals is too slight for them fully to appreciate their superiority.

Analysis of the tempered scale.

In order to divide the octave ($\frac{2}{1}$) into two exactly equal intervals one must make use of the ratio $\frac{\sqrt{2}}{1}$, because this ratio when multiplied by itself makes the ratio of the octave. Similarly, in order to divide the octave into three equal parts the ratio required would be $\frac{\sqrt[3]{2}}{1}$. The tempered semitone, twelve of which make an octave, has therefore the ratio $\frac{\sqrt[12]{2}}{1}$. The same idea has been developed further in order to afford a simpler means than ratios of comparing intervals. Each semitone is divided in the same manner into a hundred imaginary intervals called cents. The cent is ther fore the twelve-hundredth equal part of an octave, and a hundred cents make a tempered semitone, and two hundred cents a tempered tone. With the aid of logarithms it is a simple matter to turn ratios into cents; in this way it is discovered that the major-tone contains 204, the minor-tone 182, and the semitone 112. The practical advantage gained by this method is that intervals may be graphically compared (as in Appendix A) and the addition or subtraction of intervals simply means the addition or subtraction of the numbers of cents they contain, whereas it is necessary in the case of ratios to multiply and divide.

Equal temperament unsuited to Indian music.

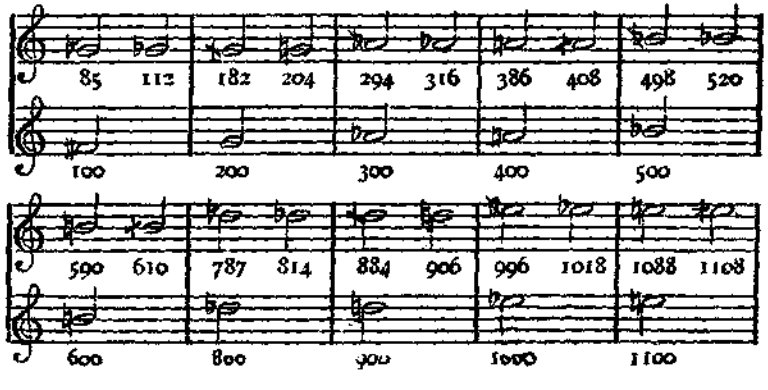
The demerits of the tempered scale as a vehicle for the expression of Indian musical thought may be summed up as follows:—

1. The distinction between the interval of 4 srutis and that of 3 is obliterated. Bihâg is confused with Bilâval, and Bhup with Deshkâr, while it is impossible to give any idea of such Râgas as Kâfi, Bhimpalâshi, Râgeshvari.
2. The atikomal and tartivra notes cannot be expressed.
3. All intervals are out of tune.

The minor-third is 300 cents instead of 316; the major-third 400 instead of 386; the fourth 500 instead of 498; and the fifth 700 instead of 702. A high degree of skill or training is not required to detect the errors in the thirds; they are flagrant; in fact, the minor-third is much nearer the dissonance of the third in Kâfi (sâ to ga ♭, 294 cents), and the major-third to the interval from ma ♮ to dha , another dissonance, 408 cents.

The ordinary Western notation equally unsuitable.

One can only conclude that Indian writers who openly advocate the use of tempered instruments are unaware of their utter inadequacy to give any idea of Indian intonation. A word of warning appears to be needed by others, who, although not in favour of tempered music, are ensnared by Western notation. They should remember that Western notation, without drastic changes such as those here recommended, is as detrimental to their music as the tempered harmonium. It is a tempered notation. The extent to which it confuses the Indian intervals may be seen from the following:—



Each of the tempered notes shown below takes the place of two; the extent of error involved in the compromise is evident from the figures of cents given. The keys of Western music with their key-signatures are part and parcel of the tempered system, and are not suited to the Indian Râgas. Some of the latter might be written under a key-signature adapted from those in use in Europe, but the majority could not, and nothing could be gained thereby. A great deal of Mr. Mudliar's book (alluded to in the previous chapter) is taken up with a lengthy description of the keys and key-signatures of European music. The information is of no value except to those who can take pleasure in hearing an approximation to Indian airs played upon the tempered harmonium.

CHAPTER III

THE STAFF NOTATION (*continued*)

IT is now necessary to explain how Indian music may be represented accurately and in detail by the Staff Notation. In doing this the author will have to go over ground which has already been traversed by other writers. Where he has struck out a line of his own, his object has been to secure the maximum of simplicity with the minimum of innovation.

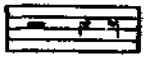
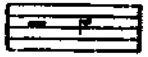
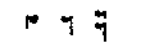
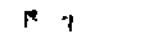
As already explained, sound is represented by notes. Silence is shown by what are called "rests." The duration of silence (vishrânti) or sound (svara) is indicated by the shape of the rests or notes used.

Note.	Corresponding rest.	English name.	Indian equivalent in mâtrâs.
𝅜	𝄻	Breve	8
𝅝	𝄼	Semibreve	4
𝅗𝅥	𝄽	Minim	2
♩	𝄾	Crotchet	1
♪	𝄿	Quaver	$\frac{1}{2}$
𝅘𝅥𝅯	𝅀	Semiquaver	$\frac{1}{4}$
𝅘𝅥𝅰	𝅁	Demi-semiquaver	$\frac{1}{8}$
𝅘𝅥𝅱	𝅂	Semi-demi-semiquaver	$\frac{1}{16}$

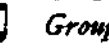
There are three degrees of speed in Indian music: *vilambit*, or slow, *madhya*, or moderate, and *druta*, or fast. Whatever the speed is, each measure (avarta) consists of a fixed number of units of duration called mâtras. The *mâtra* in madhya time will be represented by the note known as the crotchet (♩). In slow time it will be the minim (𝅗𝅥), and in fast time the quaver (♪). The relative values of notes and rests and their equivalents in mâtras of madhya time are as in the preceding page.

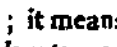
Smaller notes and rests still may be obtained by adding more hooks to the stem.

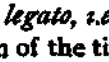
A *dot* after a note makes it half as long again. The use of dots with rests is not recommended. Two dots make a note $1 + \frac{1}{2} + \frac{1}{4}$ or $1\frac{3}{4}$ the length. Thus—

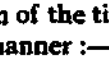
Note.	Corresponding rests.	Indian equivalent in mâtras.
𝅗𝅥..		$3\frac{1}{2}$
𝅗𝅥.		3
♩..		$1\frac{3}{4}$
♩.		$1\frac{1}{2}$
♪..		$\frac{7}{8}$
♪.		$\frac{3}{4}$

Just as rests are combined to make up the value required, notes may be combined where it is necessary or more convenient to do so in order to make the phrasing or grouping of notes clearer. In this case the *tie* or *bind* is used. Two notes of the same pitch joined by a tie are played as one note of the combined value of the two, thus: ♩‿♩ = 2 mâtras; 𝅗𝅥‿♪ = $2\frac{1}{2}$ mâtras; ♩‿♪ = $1\frac{1}{4}$ mâtras, ♩‿𝅘𝅥𝅯 = $1\frac{1}{8}$ mâtras; ♪‿♪ = 1 mâtra.

The *grouping of notes* is a guide to the accent, the first note of the group being generally more accented than the following ones. It is also when used with a figure and slur, a means of showing the division of the mâtra (or other larger or smaller unit of duration) into a number of equal parts which is not a multiple of two. *Grouping* is effected by joining the hooks of notes, thus  *Grouping by slurs* may extend over any passage of melody; it means that the passage covered by the slur is to be played *legato*, *i.e.* smoothly, as one phrase. *Grouping* to show a division of the time-unit into equal parts is effected in the following manner:—

(1)  means 3 notes equal in duration to 2, *i.e.* each $\frac{2}{3}$ mâtra.

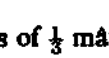
(2)  = two notes of $\frac{1}{2}$ mâtra each.

(3)  = three notes of $\frac{1}{3}$ mâtra each.

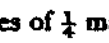
(4)  = four notes of $\frac{1}{4}$ mâtra each.

(5)  = five notes of $\frac{1}{5}$ mâtra each.

(6)  = six notes of $\frac{1}{6}$ mâtra each.

(7)  = seven notes of $\frac{1}{7}$ mâtra each.

(8) = eight notes of $\frac{1}{8}$ mâtra each.

(9)  = nine notes of $\frac{1}{9}$ mâtra each.

In No 6 the accent comes on the first, th d, and fifth notes of the group If two accents only are desired, the grouping is effected thus:—

(6)  Here each group totals $\frac{1}{2}$ mâtra.

It will be noticed that the same number of hooks is retained from one multiple of two in the dividend of the fraction, which shows what

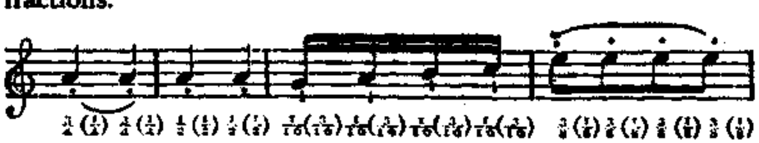
proportion each note bears to the unit, to the next multiple of two. One hook is used for half-mâtras and third mâtras; two hooks for fourths, fifths, sixths, sevenths; three hooks for eighths, ninths, etc.

Grouping by Slurs.—To avoid an unnecessary multiplicity of small rests, it is laid down that the last note of a *phrase* grouped by a slur is to be played as if of half the length shown, the remaining half being a rest. This rule applies where the note is a hooked one; in the case of longer notes, it is better to show the exact amount of rest desired. The curved line exactly similar to a tie used in the groupings below is designated a slur. It may be used of any length to show the phrasing or legato grouping of a melody.

Below each note is written its mâtra-value, rests being shown in brackets The manner in which the four demi-semiquavers are grouped with the three following quavers should be noted. A more cumbrous way of writing this passage would be—

It is clear that the last note of a phrase must be cut off or detached from what follows; hence the use of a slur implies a short rest. The rule above stated as to the time-value of such rests is founded on the practice of Indian singers.

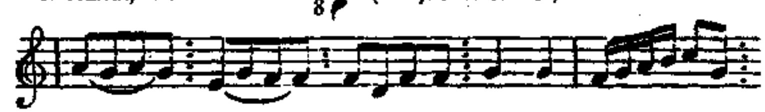
Sometimes notes which do not come at the end of a legato phrase are played in a detached manner. This is called *staccato*. There are three degrees of staccato, shown by (1) a slur and dots above or beneath the notes, (2) by dots alone, (3) by dashes. The effect of each is here shown in the same manner as above by writing the "laya" or mâtra-values in fractions.



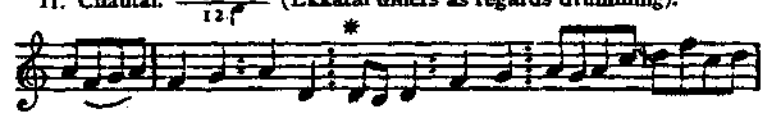
Emphasis or accent is sometimes shown by grouping, as above stated; it also follows from the nature of the measure, a subject to be dealt with; occasionally a special emphasis is given to a particular note apart from that which comes naturally from the measure or the phrasing. Emphasis of this kind is denoted by the signs ∧ or > placed above or below the note in question. When very strong emphasis is required the letters *Sf* are used.

Music set to time is divided into *measures* (âvartas), which are marked off by upright lines or *bars*. The measure consists of a stated number of mâtras with accents occurring at regular intervals. Accents are: strong (sam), medium (tâli), or weak (khâl). The *strong accent* follows immediately after the bar; the medium accent follows the dotted bar; and the weak accent follows the dotted half-bar. The character of the measure may be shown by a time signature. A very good form of signature is one adopted by Mr. H. P. Krishnarao, of Mysore ("First Steps in Hindu Music," Weekes & Co., London). Above are noted the mâtras upon which the chief accents fall, and below the number of mâtras in a measure and their time-value. Thus $\frac{1.5.7}{8♩}$ means that there are eight mâtras represented by crotchets in the measure, and that the accent falls on the 1st, 5th, and 7th. The addition of subsidiary dotted bars is useful, as they show at a glance the phrasing of the melody. The measures in most frequent use are—

I. Adıtâl, tritâl or tintâl. $\frac{1.3.7}{8♩}$ (Panjâbi is slower).

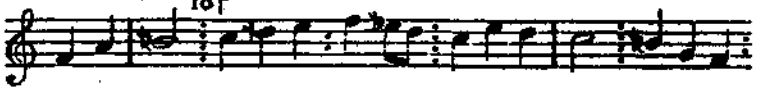


II. Chautâl. $\frac{1.5.9.11}{12♩}$ (Ekkâtâl differs as regards drumming).

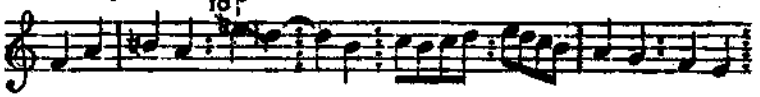


* The dha is ♮ like the preceding one. See the paragraph below on "Accidentals."

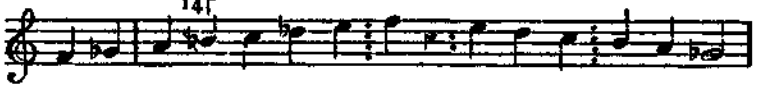
III. Zhampâ. 1.3.8 / 10



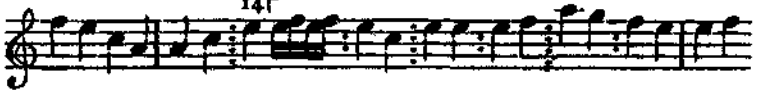
IV. Surphâkta. 1.5.7 / 10



V. Dhamâr 1.6.11 / 14

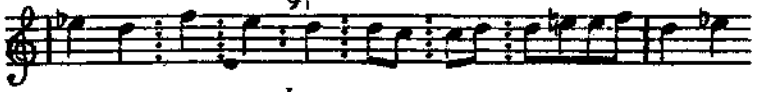


VI. Âda Chautâl 1.3.7.11 / 14

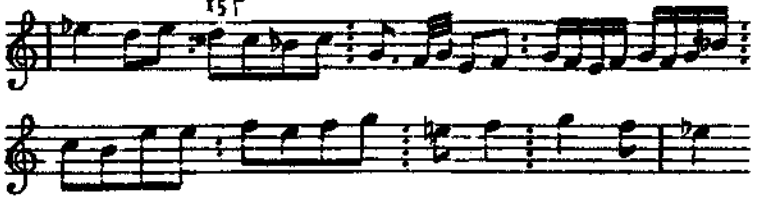


VII. Tevrâ. 1.4 / 7

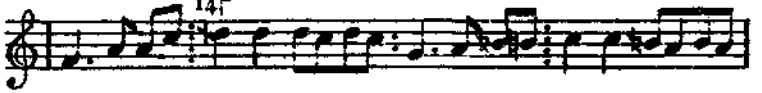
VIII. Matta Tâl. 1.3.4.6.7.8 / 9



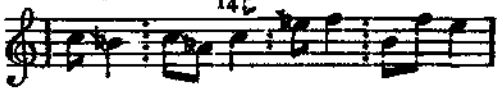
IX. Savâri. 1.5.9.13.14½ / 15



X. Zhumbirâ. 1.4.11 / 14



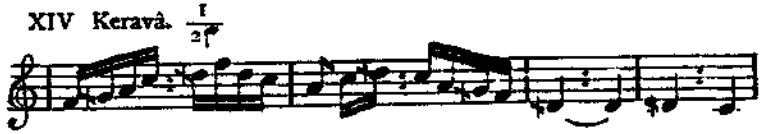
*XI Dipchandi 1.4.11 / 14



XII. Dhumâli.* 1.3.4.5.7.8 / 8

XIII Dâdrâ. 1 / 2

XIV Keravâ. 1 / 2



The sign placed before a note, which shows which sruti of that svara is to be used, is called an *accidental*. Where the same sruti occurs more than once in an âvarta, or measure, the accidental need be used once only. The object of this rule is to avoid an unnecessary number of accidentals.

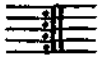
Thus, in Example IV., first complete bar, there are three komal madhyams, the accidental ♮ being used for the first only. If the second, however, had been tivra, and the third again komal, it would have been necessary to place the sign ♯ before the second, and ♮ before the third. It will be seen that the rule only applies where the sruti is not changed.

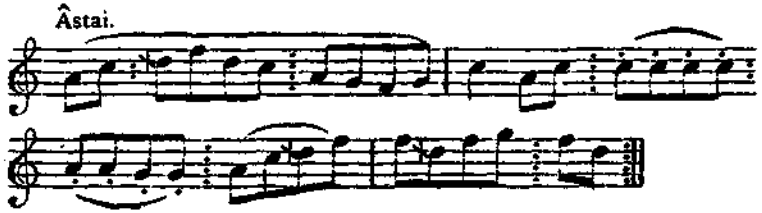
It is necessary to adopt terms and signs which will show the *intensity* or degree of loudness or softness of a composition. The following terms are in general use in European music, they represent fixed degrees of intensity :—

Sign.	Term.	Rendering.
pp	pianissimo	very soft
p	piano	soft
mp	mezzo-piano	moderately soft
mf	mezzo-forte	moderately loud
f	forte	loud
ff	fortissimo	very loud

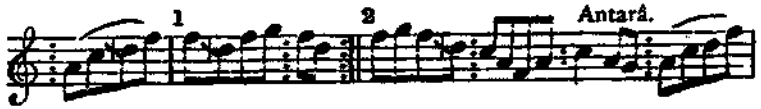
A gradual increase of intensity is shown by the sign and a gradual decrease by 

* Dhumâli is not differentiated from Tintâl except in a certain kind of solemn music

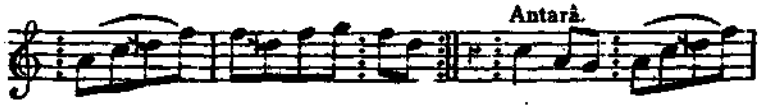
A *double-bar*  is used to mark the end of a composition or of any section thereof, such as the "âstai" or "antarâ." It may occur at the end of or at any place in a measure or "âvarta." When used with the sign 𝄐, which is known as the *pause*, thus  , it signifies the end of the whole composition. A double-bar with dots  is a direction that the composition is to be repeated up to that point, either (*a*) from the beginning, or (*b*) where the double-bar in this form  has been previously encountered, from that point. Double-bars should be so arranged that the integrity of the measures is preserved. In the following example, the first and third bars together form in the repeat one whole bar of eight mâtras.



Occasionally the last bar before the repeat sign is changed after the repetition, so as to lead to the next section. This is shown by the use of the numerals 1 and 2. The portion marked 1 is to be performed the first time, and at each repetition except the last. The part marked 2 is to be performed at the last repetition in substitution for 1, which is omitted. For instance, the last portion of the above example might be written as follow :—



In the next example there is no change

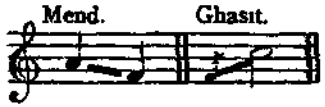


It is convenient to write such words as âstai and antarâ at the beginning of the appropriate sections. Such directions as "repeat âstai once or twice," when used with a double bar, will be easily understood and will save writing preceding sections again in full.

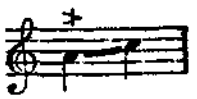
If it is required to repeat a composition from the beginning or from a certain point and this cannot be conveniently indicated by a double bar and dots, the directions "repeat from beginning" and "repeat from 𝄋" may be used respectively, the sign 𝄋 being placed over the point from which the repeat is to commence.

Embellishments or ornaments are much used in Indian music With the exception of the mend and ghasit, they consist chiefly of short notes the time of which is taken out of that of the note which they adorn. These notes are sometimes "diatonic," that is to say, taken from the scale of the Râga, and sometimes what are generally speken of as quarter-tones The author makes no attempt to classify them or define them ; it is sufficient for his purpose to describe those which require special signs to express them. Others may be represented by the actual notes and in the actual time by means of the signs and notes already described.

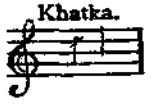
The *mend* is a glide from one note to another. So also is the *ghasit*, but they differ in this that whereas the ghasit proceeds from a grace-note and is quick and somewhat violent, the mend passes over all intermediate sounds gently and is sometimes allowed to dwell for the briefest possible moment on the diatonic notes Their signs are—



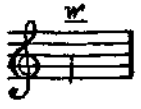
Thok is an ornament applied to the first note in a mend. It consists in attacking the note forcibly, blending it at the same time with the "quarter-tone" above. It is primarily an ornament obtained by plucking a string with emphasis while the left hand almost simultaneously stretches the string to one side. The sign here adopted is taken from the sign of emphasis (>).



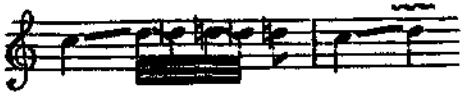
The *khatka* may be represented by grace-notes ; no special sign is needed. Grace-notes are minute in point of time ; they take their time out of that allotted to the note to which they are attached, and are represented by small notes. A single grace-note is usually cut through with a line as shown in order to distinguish it from a peculiar kind of note known in European music as the "appoggiatura."



Two kinds of trill are in common use, *gamak* and bhelava. The first is somewhat like a "mordent" with quarter-tones ; it may be represented thus :—



Bhelava comes after a mend, and consists of a slow trill with the next higher or lower sruti. It resembles the vibrato.



The ordinary trill of Europe is performed in combination with the next note above in the scale. and is denoted by the sign *tr*.

The writer's acknowledgments are due to Abdul Karim, some of whose melodies [1] have been used or mutilated to serve as examples, and to Yeshvantrao Dinkar Bhramanâlkar, who has published in a kind of "tonic-solfa" notation several of Abdul Karim's melodies.[2]

[1] "Sangit Svaraprakâsh." Srirâmtatva-Prakâsh Printing Press, Belgaum.
[2] "Jain Bhajanâmrit Padyâvali." Printed at the Arya Bhushan Press, Poona.

CHAPTER IV

THE INTERPRETATION OF THE ANCIENT TEXT-BOOKS

THIS chapter will include annotated translations of the most important parts of the Nâtya Shâstra of Bharata, which is generally allotted to the fifth century A.D., and of the thirteenth-century text-book, the Sangit Ratnâkar of Sârangdev. The writer knows of no detailed exposition of Indian musical theory in any treatise except Bharata's Nâtya Shâstra, earlier than the Sangit Ratnâkar. Regarding later works, it may be said without fear of contradiction that the Ratnâkar has been consistently misunderstood by all succeeding authors.

To understand the two works named one must grasp two important facts, namely—

(1) TLat the system of tuning upon which they are based is that mentioned at p. 109 of Captain Day's "Music of Southern India." The chanterelle strings in such instruments as the vina and sitâr were dha (the bass note), and ri ♭ and ga The drone used was almost invariably dha ♭ and ri ♭ combined. These were probably the notes given by the tambura. The wire upon which the melody was played was ri ♭.

(2) The sruti was not an exact unit of measurement. Two srutis made a just semitone, three a minor-tone, and four a major-tone.

The evidence to establish the first of the facts mentioned is as follows :—

(1) Although the present writer has not been able to come across a vina-player who tunes his instrument in the method named, it is clear from Captain Day that the method survived until modern times in the Hindustâni school of music.