THE
PSYCHOLOGY OF MUSIC

ENLARGED EDITION

BY

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Preface to the Enlarged Edition

In the year 1916, the first edition of the Psychology of Music appeared in the form of a pamphlet. Since then, many reviews have appeared on it. Among these the opinions of two eminent scholars, Professor R. Srinivasan, M.A. of Trivandrum and Mrs. Margaret E. Cousins, B. Music, as expressed respectively in the Theosophist, Madras (March 1917), and the Modern Review of Calcutta (Jan. 1917) are important. The remarks of Mrs. Cousins are very prejudiced and as such, they are most valuable. They contain the confessions of a Western musician, difficult to extort in ordinary circumstances. They have been answered in the body of the book.

The following are some of the authorities whose works have been consulted:—William James, Hoffding, Titchener, Huxley, Sully, Babu Bhagavan Das, Saranga Deva, Chinnasamy Moodaliar, Pingle, Fox Strangways and Miss Margaret H. Glyn. Quotations from these authors are given sometimes in full and sometimes in an altered form for which I crave for their indulgence. I am very thankful to Vidwan Balasaraswaty, of the Guruvilas Printing Works, who in his capacity of a good artist, wrote from my manuscripts all the music by hand before they were graphotoned in Madras. I must also express my sense of gratitude to my friend, Mr. V. Krishnaswamy Iyengar, B.A., Inamdar of Venkatapuram, but for whose encouragement this book would not have been published.

26, SANKARAPURAM
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H. P. KRISHNA RAO.

INTRODUCTION

It is a pity that music, though unquestionably a branch of mental science, should have received but scant attention from the psychologist. The operations of the mind even in lunacy have of late been subjected to minute examination. Animal and child psychology has also reached a high degree of advancement; but the psychology of music, i. e., the nature of the changes that the mind undergoes under the influence of music, has been entirely ignored. On the other side, the musician has turned a deaf ear to the laws of psychology, so that a complete divorce exists between the art of music and the science of mind. The Westerner traces his art from an imaginary land while the Indian derives his from tradition, legend and religion. No where is music placed side by side with the other arts and its technique subjected to the test of psychology.

Western music with all its wonderful achievements in the field of Harmony has suffered more. The method of its study as now obtaining in Europe is not conducive to its progress on psychological lines. Dr. Alfred Westharp, Music Doctor, is very clear on this point. "What you played when a child and what you make your children play, the scales, are nothing but the material of Harmony; they are not tonal successions, successions of more or less melodious sounds. They are really mathematics." The shackles of Harmony bind the European from the beginning. The Indian is on the right track in the beginning but stops after a very short course. In either case, psychology is never respected.

The principles enunciated in this treatise are quite new. They are chiefly based upon psychology. To those who, for centuries, have neglected, nay even denied every possibility of reconciling the art of music with the science of psychology, they may appear fanciful and even grotesque. But to the present writer, they are as clear and convincing as mathematics. All lovers of music who have the progress of the art at heart are sure to herein find the key which will help them to unravel the so-called mystery that surrounds the art.

Practical artists need not be told that a piece of music played by heart is ten times sweeter than that played at sight. They will therefore do well to learn the examples by heart before testing their effect. Indian music always flows from the heart and there is no reading at least while feeling it. When testing the examples given in the book there should be a continuous drone consisting of the middle C together with its octave as well as its fifth in a mild and and sweet form, never obscuring the melodies. The examples of Western music found in this book are, as pointed out by some critics, very elementary in comparison with the classical works of celebrated composers. To begin English grammar, are examples from Shakespeare and Chaucer useful? Miss Margaret Glyn says, "And music is the least conventional, the most natural of all the arts, its elements are as perceptible in the great art-work as in the simple melody." She further adds,—"If we cannot discover the origin of music from primitive melody, we shall not find it elsewhere."

A close study of this work would reveal the following facts:—

1. The mind is a vibrating substance; its vibrations are regular.
2. Its faculties of perception, enquiry, egoism, etc., are stages in the stream of consciousness brought about by the variation of the number of its vibrations in a particular ratio.
3. The number of stages in the stream as proved by the law of psycho-physical parallelism is only thirteen corresponding to the musical scale.
4. The musical scale is but the reflection of the mind when it is excited by emotion and every semitone expresses a stage.
5. Emotions are but the compounds of the elements of consciousness.
6. In all its operations, the mind ascends and descends as notes do in music.
7. Melody is an agreement of musical notes according to an emotion.
8. Harmony is an agreement of melodies, not merely of notes or chords.
9. Both are imitative arts; they borrow their material directly from Nature.

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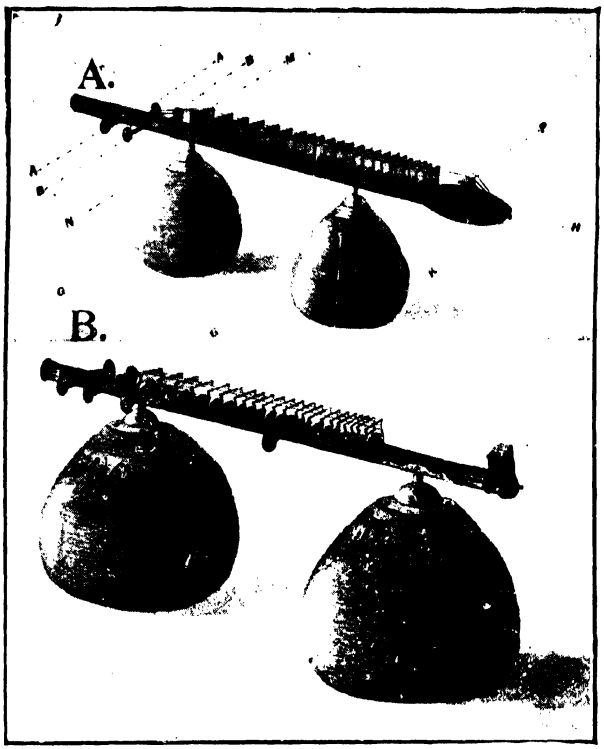
Rudra Veenas used in Northern India.



A. A very rough sketch of Rudra Veena of Somanatha, 17th century.

A-A	... Movable pegs	G	...	...	Gourd
B-B	... Immovable pegs	H	...	...	Hooks
M	... Meru	K	...	...	Kakubha
N	... Nabhi	P	...	...	Patrika

B. Rudra Veena in use at the present day. It has seven strings, 4 on the frets, 2 in front and the 1 behind is hidden from view by the frame of the Veena. All the pegs are movable.

The Veena of S. India.

This instrument is called the Saraswati Veena. It has seven strings; four open for playing and three in front to be used for resonance as well as for beating time with the little finger. Its tone is very sweet.

The Psychology of Music

CHAPTER I.

The definition of Music.

Music is the language of emotion

"Music in the valley; music on the hill.
Music in the woodland; music in the rill.
Music on the mountain; music in the air.
Music in the true *breast*; music everywhere."

All living beings are gregarious. Fishes live in shoals, cattle in herds, and men in communities. Mixed groups, like those of men and animals, whether in peace as in the town or at war as in the jungle, are also common. Such congregations are necessary for the very existence of life, its offensive and defensive purposes, as well as the preservation of the species. Solitude like that of the phoenix is a mere poetic fancy.

Means of communication of ideas between individuals of the same group or of different groups is absolutely necessary to gregariousness, and it is the necessity of maintaining it that has led to the evolution of languages among all the living beings. Ants and reptiles, birds and beasts have their own language, though in some cases it is invisible and inaudible. How apparent is the oneness of the object with which ants burrow a hole in the ground and convey a grain of corn into it, and how clear is the motive when a pair of

birds gather the materials of a nest for their would-be offspring! Concerted action is impossible without some means to communicate. Again, a shriek or a grimace from a monkey at the sight of an enemy is enough to put the whole herd on its guard and its language, crude and limited though it may be to us, is to them distinct in meaning and sufficient in purpose.

Man has out of selfishness restricted the use of the term 'language' to his vocal manipulation only which after all is but one of the several ways of communicating ideas and styled all other creatures *dumb*. On the other hand, the owl which plies by night would, if consulted, call all men *blind*. Man is no match even in the daylight to the vulture which spots its prey from afar in the sky. Where is his sense of smell before the tiny little ant or the wretched cur? Mother Nature is kindly to all her offspring and holds an even balance among them. She also provides a compensation for the want of the gift of the gab.

Is the word 'language' true to its origin? The word is derived from *Lingua* the tongue. The labials, gutturals, nasals and palatals have very little to do with the tongue. A man who had his tongue removed up to its very root during an operation was able to talk quite easily but with some amount of indistinctness when the linguals intervened. The application of the term 'language' need not therefore be restricted to the speech produced by man by means of the tongue. It may very well mean a system of signs, whether sounds or gestures, having naturally or artificially fixed meanings and produced by man or beast.

Primitive man had no better means to communicate his thoughts and feelings than the lower animal. Probably gesture at first performed the principal part even to an extent that the earliest human language may be said to be a sign-language. Against this view some hold that the tone-language consisting of the various inflections of the voice for expressing joy, sorrow, or anger must have preceded the sign-language. It stands to reason therefore to suppose that our forefathers used the gesture-signs only as an appendage to the vocal signs. The fact that dumb persons who never know what we call sound, even now accompany their gestures automatically with meaningless sounds, supports this view. The order of language in point of precedence is therefore from the tone to the gesture and thence to the word.

The same order is visible in the bodily growth from infancy to old age. The baby is born with the tone-language. It starts life with a cry. It cries for milk, it cries for sleeep, and it cries for comfort and tone is its only means of communication. As time goes on it begins to see and use gestures. It is in the third stage that words are learnt. But when man grows old, these forsake him and make room for gestures. At last, alas! the language of the tone, the waning moan accompanies him to the grave.

Of the three kinds of language the first two are natural and the third is artificial in formation. A slow dragging tone signifies pain. Laughter suggests mirth. Quick and violent sounds indicate a state of excitement. Besides such sounds which proceed from man and

convey feelings directly we have to take into account those that are made by the birds and the beasts as well as the sounds emitted by the movements of inanimate objects,—the hissing of the wind, the roar of the sea and the peal of thunder. From such materials whose form is found in animate and inanimate nature in an unchanging manner, is built and developed the tone-language.

Then follows the sign-language. To bite the lip, to knit the brow, to look askance, to shrug one's shoulders, to strut like a peacock, to pounce like a lion, express particular feelings. Like the tone-language, the sign-language is based upon natural gestures, which are permanent in form as well as significance. The third kind of language is the word-language. Unlike the first two it is entirely conventional. If we hear a laugh or a groan, we need no explanation to tell us as to what it signifies any more than when we see a sad face; but a group of words signifies nothing unless we are told, in what sense a community uses them. The term 'rose' may, by common consent, be changed to mean a thorn; while no earthly power can alter the significance of a wink or a sigh. To an Englishman the word 'rose' conveys two ideas. Even Esperanto may after some time to come be found useless. Not so are the tone and the sign languages.

The spoken language is confined to man only and it expresses thoughts directly and feelings by association. The sign-language expresses thoughts as well as feelings, while the tone-language is primarily the language of emotion, connecting man with the lower

animals and ultimately with the inanimate world. Corresponding to the word-language, it has its own alphabet, its words, its grammar and literature; and as an art, its own elements of beauty. In the communication of ideas, however, all the three kinds of language though distinct, generally co-operate with one another. When Antony addressed the Romans thus:—

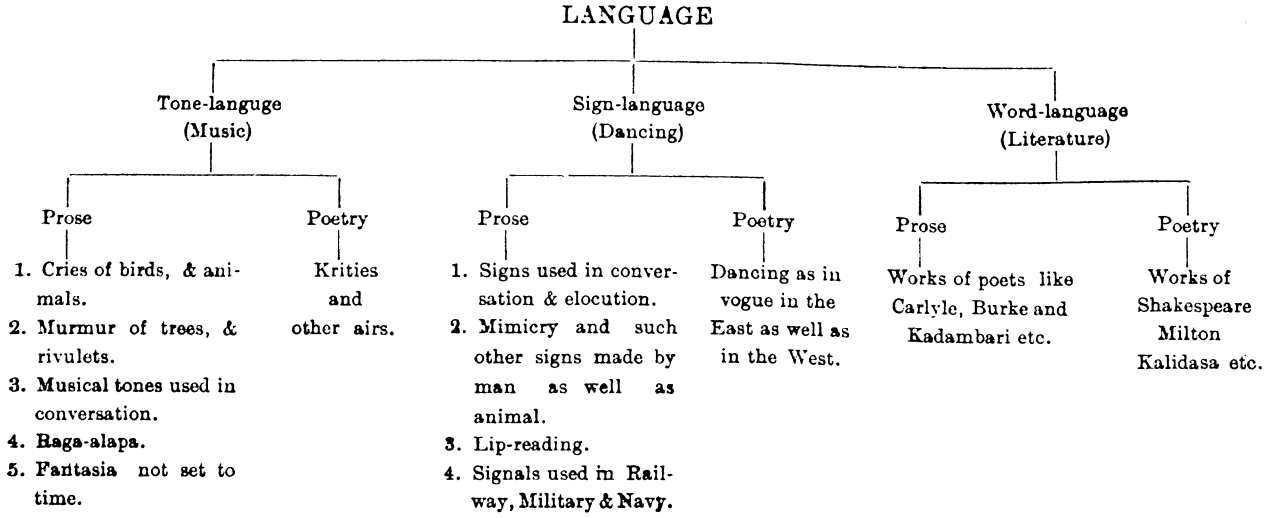
> Friends, Romans, Countrymen, lend me your ears.
> I come to bury Caesar, not to praise him.
> The evil that men do lives after them.
> The good is oft interred with their bones.

and when Portia pleaded before the court of justice in the following terms:—

> The quality of mercy is not strained,
> It droppeth as the gentle rain from heaven
> Upon the place beneath : it is twice blest;
> It blesseth him that gives and him that takes :
> 'Tis mightiest in the mightiest : it becomes
> The throned monarch better than his crown ;
> His sceptre shows the force of temporal power,
> The attribute to awe and majesty,
> Wherein doth sit the dread and fear of kings ;

both of them must have called to their aid various gestures as well as modulations of voice.

In æsthetics, the tone-language is known as Music, the sign-language as Dancing and the word-language as Literature. When each of these is highly emotional and set to time we have poetry. The following table shows the classification of languages.



N. B.—Language exists in the prose form more in Nature than in Art while poetry requires the hand of the artist to give it a perfect form.

Music according to the Indian writers, comprises vocal and instrumental performances as well as dancing. Its object is to express the various emotions. In the West also it is stated as the language of the emotions, and divided into Harmony and Melody. Eastern music is melodic in structure and the Western is based upon Harmony. Apart from the sameness of definition, no clear conception of the nature of the art, appears to prevail anywhere. In India the art is too much spiritualised while in the West a cloud of mystery surrounds its nature and execution.

Rousseau's definition that music is the art of combining sounds so as to please the ear, falls short of the mark. No definition is perfect unless the function of the art is referred to the heart. Sounds may please the ear but not the heart. Music is no flattery of the ear. It must appeal to the heart. Every word expresses some thought; but a combination of words does not constitute any language unless they convey a complete idea to the mind. A combination of colours may please the eye, but it is no art unless it exhibits the form of some man or animal or some other visible phenomena existing in nature. Similarly, a combination of notes, though pleasing it may be to the ear, is no music unless it represents the inflexion of the voice of man or beast; or of any other sound produced by an inanimate object or objects in motion so as to give rise to an emotion.

Nor is Darwin quite in the right when he states that music is evolved out of the sounds which birds give out when they make love to their mates. Music draws its material from the pathetic as well as the

erotic. The cry of pain with which the baby ushers itself into the world is a better material for music than the billings of the love-struck couple. In art, there is more of plaintiveness than mirth. Cambarieu defines music as thinking in sounds. It would be far better to state that music is feeling in sounds. A combination of sounds to be recognised as music must appeal to feeling. Thought is secondary; in fact, as Mr. Marshall says 'Thought and feeling exist in inverse ratio.'

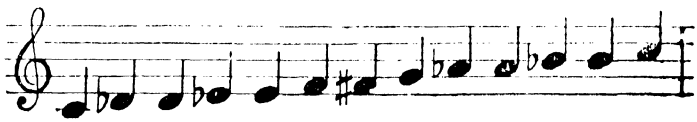
The art of dancing is often included in music by the Indian writers. Dancing is entirely a different art from music. One appeals to the ear and the other to the eye. The element of rhythm does not bring dancing under the definition of music. Again, vocal music is not different from the instrumental as the larynx is but a kind of musical instrument like the flute.

Music is but the language of emotion. It is the art of combining tones in such a way as to directly imitate the sounds, produced jointly or severally, by man or animal under the influence of emotion. Besides expressing and personifying the sounds made by the motion of such objects as trees, rivers, or clouds so as to give rise to different emotions, music describes by analogy the motions themselves, such as skipping, jumping or sliding of objects, animate or inanimate and even represents such natural figures or scenery as circles, columns of pillars or ranges of mountains.

CHAPTER II.

The Theory of Music.

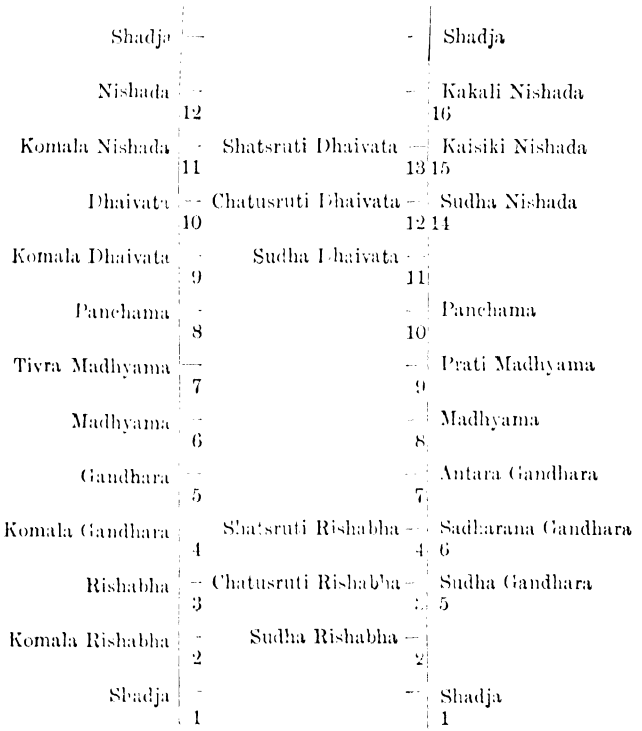
The alphabet of music consists of seven notes. In Indian music they are called Shadja, Rishabha, Gandhara, Madhyama, Panchama, Dhaivata and Nishadha. In singing, these names are shortened as Sa, Ri, Ga, Ma, Pa, Dha, and Ni. They correspond to the Western symbols C, D, E, F, G, A and B. Sa and Pa are so clear in tone and feeling that they are now rightly treated as fixed notes. They undergo no variation. Ri, Ga, Ma, Dha and Ni have each two forms; one natural (Prakrita or sudha) and the other (Vikrita) sharp or flat. The whole gamut stands thus—Sa, Ri flat, Ri, Ga flat, Ga, Ma, Ma sharp, Pa, Dha flat, Dha, Ni flat and Ni as in the chromatic scale following:—



Flat notes might as well be considered as sharps of the lower ones; but this alteration would not help us in any way. It is better to have Sa and Pa stationary and vary the others. Notes, after all, like roses, would sound as sweet by any name.

Two systems of music are prevalent in India; the Northern or Hindustani and the Southern or Karnatic. Though the notes used in both are the same in pitch, they are known by slightly different names. While the Hindustani system uses generally twelve names for the

twelve semitones, the Karnatic system adopts sixteen by giving two names to each of the four of the notes. The Northern and the Southern scales roughly stand thus, the full modern names of the notes being, when read from the bottom upwards, as follows:—



Prati or Varali Madhyama in the Karnatic system goes by the name of Tivra Madhyama in Hindustani. Whatever difference there may be in the nomenclature, their pitch is the same. The duality of names in the Karnatic system to one and the same note is not proper, but it is a very ingenious device introduced by Venkatamakhi to facilitate the classification of root-

A Raga is a melodious combination of musical notes in the scale. At least five different notes including Sa are necessary to constitute a Raga. A Raga of five notes is called *Audava*, a Raga of six notes is called *Shadava*, and a Raga of seven notes is *sampurna*. The classification of Ragas in Upper India is in an unsettled state. There are six male ragas; each of these has five wives—making up a total of thirty-six principal Ragas. The rest are treated as derivative Ragas. The other way of classification into Ragas (male) and Raginis (female) is equally illogical. Male Ragas are Bhiran, Malava, Sriraga, Hindola, Dipika and Megha. Female Ragas are Todi, Marvi, Desi, Gurjari, Bengali and almost all ragas which end in *I*. In each of these ragas, there may be airs designated as Khyal, Tappa, Tomri, Gazal, Tillan, and Astai. These are adapted to various Talas which are many in number and in the execution of music the chief graces and embellishments used are known as *Ghasit*, *Mend* and *Kampit*. The pieces are sung to a fixed drone with Tabala and Sarangi as accompaniments. Essentially the Southern and the Northern systems are one and the same. The great liberty allowed in the use of notes and of tala in the Hindustani system makes it all the more melodious in a way than the rigid Karnatic system.

The Karnatic system of music is more highly systematised than the Northern. There are seventy-two root-ragas derived by using one variety of each of the seven notes in the following manner. The octave is divided into two tetrachords S, R, G, M and P, D, N, S.

The first tetrachord may be arranged in six ways, thus:—

S R_1 G_1 M_1	or	C	D flat	E double flat	F
S R_1 G_2 M_1	„	C	D flat	E flat	A
S R_1 G_3 M_1	„	C	D flat	E	F
S R_2 G_2 M_1	„	C	D	E flat	F
S R_2 G_2 M_1	„	C	D	E	F
S R_3 G_3 M_1	„	C	D sharp	E	F

The second tetrachord may similarly be written in six ways,—

P D_1 N_1 S	or	G	A flat	B double flat	C
P D_1 N_2 S	„	G	A flat	B flat	C
P D_1 N_3 S	„	G	A flat	B	C
P D_2 N_2 S	„	G	A	B flat	C
P D_2 N_3 S	„	G	A	B	C
P D_3 N_3 S	„	G	A sharp	B	C

Now, by adding each of the second varieties to each of the first, we get thirty-six Ragas and by changing in each of the combinations M natural to M sharp, we get thirty-six more; thus making up a total of seventy-two Root-ragas.

Unlike the Hindustani system, no Raga generally takes more than one note of the same name. By dropping one or two notes in the ascent or descent or in both, we get derivative Ragas which are about 35,000 in number! Owing, however, to the influence of the Hindustani system, certain ragas like Behag, Kanada, Khamas, and a few others have been introduced into the south and they take two varieties of the same note.

In all these Ragas, we may have pieces called Gita, Varna, Swarajati, Kriti, Tillana, Pada and Javali.

In early Indian music, the *sruties* or quarter-tones played an important part, though their accurate pitch or number was vaguely understood as even now. From these indefinite and airy *sruties* which are supposed to correspond to the twenty-two *nadis* or cords in the brain were formed the three *Gramas*, or scales, the Shadja-Grama, the Gandhara-grama and the Madhyama-grama. The middle grama, they say, is in use only in the land of the angels. In the other gramas, when a note was selected and a scale was started on it, a jati named after the initial note was formed. There was one jati for each of the seven notes and these were called *Sudh* gatis. There were seven jatis in shadja-grama and three in the Madhyama-grama. Modulation was also permitted from one jati to another. In the construction of Ragas, the initial and the final notes, the consonant and dissonant notes were given much prominence. Notes had also to be combined in a particular order and these combinations were embodied in what are called the *Kuta-tanas*.

Ancient Indian music at the time of the Natya sastra and the Ratnakara was in a chaotic condition. The *sruti* question was the most vexed one. However interesting and scientific it may be to engage oneself in the discussion of the accuracy of the sruties as Fox-Strangways, Deval, Abraham Pandithar, Bhatkande and Clements have so ably done, it is a preposterous and unscientific procedure to build any system on these sruties which are like stairs of sand. There

are two methods of scientific investigation, the analytic and the synthetic. The latter, though convincing is attended with many pitfalls. No Huxley has ever succeeded in making a living cell though he knew its composition perfectly. So with music and even the spoken language. These sruties correspond to the complicate sounds in the science of phonetics such as "High-front-round vowels" or "High-mixed-low vowels" and so forth, all of which have to be reached through the analytic process as done by Bell and Keats. To learn English, it is enough to begin with the twenty-six letters. The next step would be to distinguish between the vowels and the consonants and then to divide the consonants according to the organs of production as dentals, labials etc. The ultimate step would be if necessary to entangle oneself into the meshes of high-backed to low-backed letters, out of which very few people escape with credit. Similarly, no scholar has ever made out a clear case of the sruties. To introduce the question of the sruties to a student of Indian music would be a mistake. The never-ending dispute among the modern scholars about the correctness of the sruties is due to their beginning at the wrong end and over-looking the weakness of their synthetic method.

In the octave, the thirteen semi tones are the fundamental ones. They serve our purpose well. In highly emotional music several other intermediate microtones intervene which are but the semitones themselves slightly displaced under the impulse of emotion. Their number is neither twenty-two nor twenty-four

but infinite. Abraham Pandithar divides the octave into ninety-six parts.

In Europe, till the 10th century, only one note, repeated at whatever pitch the melody might be, suggested the idea of using a continuous note in place of a rhythmic one called the drone-bass. The earliest attempts at Harmony was the Diaphony or Organum. This consisted of a succession of fourths, fifths or octaves. The next step was the Descantus which consisted of a manipulation of two different tunes so as to make them tolerably endurable when sung together. From this Descantus sprung up Counterpoint and that whole genus of polyphonic music which was developed to a high pitch of perfection between the 14th and the 17th centuries. Towards the end of the 17th century, the standard of Harmony was fixed by Rameau and his principles were the most valuable. By the beginning of the 18th century, the practice of grouping the harmonic elements of music or chords according to the keys to which they belong was universal. 'The history of harmony is the history of ever-increasing richness of combination from the use, first, of simple consonances superimposed on one another, which we call common chords and of a few simple discords, simply contrived, then of a system of classification of these concords and discords by key-relationship, which enables some of them to be used with greater freedom than formerly.'

Ancient Greeks are the progenitors of the modern European music. Their scales were called modes ecclesiastical. Though they knew the combinations which are called chords and categorised them, they did

not make use of them in musical performances. Their scales were fitted for the development of melody. This fact has led a number of scholars into inferring that the Indians borrowed their theory of music from the Greeks, while a few others hold the opposite view that the Greeks borrowed theirs from India. A close study of the development of early Greek and Indian systems of music would show that both of them developed quite independently of each other. Indian music underwent a thorough transformation after the Mohammedan conquest and excepting a few obsolete terms, it has very little in common with the primitive system. It has now attained the state of perfection in melody.

CHAPTER III.

The Science of Music.

When a body such as a carriage wheel or a music-string is thrown into a state of vibration by means of a blow or other cause, it produces sound. Sounds differ from each other in three respects:—loudness, pitch and quality or timbre. The loudness of sounds depends upon the extent of the to and fro motion of the air-particles. The same sound *a* may be uttered soft or loud by the adjustment of the muscles of the mouth. The pitch of sounds depends upon the rapidity of the vibrations. A music string changes its pitch when tightened. A child in crying for toys changes the pitch of its voice. So does a musician while singing. The quality or timbre which distinguishes a note sounded on one instrument depends upon the form of the wave of the air. Voices of different people and sounds of different instruments differ from one another in timbre.

Sounds may be divided into noises and musical notes. A mere noise is an irregular disturbance. When the vibrations are regular, musical notes are produced. There must be at least sixteen complete vibrations in a second to produce a musical sound. The sound which is produced by twice as many vibrations as are required to produce any given sound is called the octave of that sound and starting on this principle from the sound produced by sixteen vibrations, it has been shown that the human ear can distinguish

sounds extending through eleven octaves, the upper limit being the sound produced by 32,768 vibrations in a second. Then, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768 are the vibrations of the eleven octaves given in order and 256 is the number of vibrations given by the C or Sa of the middle register. For simplicity of calculation the number 240 is sometimes used for C instead of 256.

The absolute pitch of the notes of the Diatonic Major (with C as the tonic) or the Sankarabharana is as given below:—

C	D	E	F	G	A	B	C
256	288	320	341	384	426	480	512
Sa	Ri	Ga	Ma	Pa	Da	Ni	Sa
240	270	300	320	360	400	450	480

The intervals from C of ~~256~~ 240 vibrations to each of the other notes of the scale in order are as follow:—

C to D is called a Second and measured by $\frac{27}{24} = \frac{9}{8}$

... E ... Major third ... ... $\frac{30}{24} = \frac{5}{4}$

... F ... Fourth ... ... $\frac{32}{24} = \frac{4}{3}$

... G ... Fifth ... ... $\frac{36}{24} = \frac{3}{2}$

... A ... Major Sixth ... ... $\frac{40}{24} = \frac{5}{3}$

... B ... Major Seventh ... ... $\frac{45}{24} = \frac{15}{8}$

... C ... Octave ... ... $\frac{48}{24} = 2$

Besides these we have the following intervals:—

From A to C is called a Minor third measured by $\frac{48}{40} = \frac{6}{5}$

E C ... Major Sixth ... $\frac{48}{30} = \frac{8}{5}$

D C ... Minor Seventh ... $\frac{48}{27} = \frac{16}{9}$

Hence the Diatonic Major scale will be represented thus:—

C	D	E	F	G	A	B	C
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2

Forming the intervals between the successive notes of this scale, by dividing each ratio by the preceding, we get—

C	D	E	F	G	A	B	C
$\frac{9}{8}$	$\frac{10}{9}$	$\frac{16}{15}$	$\frac{9}{8}$	$\frac{10}{9}$	$\frac{9}{8}$	$\frac{16}{15}$	

It may be established as one of the fundamental principles of music that the ear can endure notes, be they simultaneous or successive, on this condition viz:— that they should bear simple ratios to each other in respect of the number of their vibrations per second, that is to say, that the ratio of the number of vibrations per second of the notes should be expressed by low numbers. In fact, the smaller the number that expresses the vibrations (Sa : Ga : Pa :: 4 : 5 : 6) the more pleasing is the combination. When two notes not exactly of the same pitch and bearing intricate ratios are sounded together, a sound is obtained of varying loudness, now strong and now feeble, and very marked

jerks or shocks are perceived. These shocks called beats are unpleasant in effect and spoil the Harmony.

In order to obtain perfect Harmony the ratios of the notes must be accurately maintained as given above, whatever be the note we start from or keynote as it is called. In order to produce a musical effect, a musical piece is suddenly raised or lowered bodily in pitch by selecting a higher or lower keynote. This act of altering the pitch of the piece is called *modulation*. As a great number of keynotes are employed in music, it is practically impossible, at least in fixed-toned instruments, like the piano or organ, to maintain these ratios strictly for all of them. Compromise of some sort, therefore, becomes necessary and different systems of compromise are called different modes of temperament. The simplest mode of temperament and the one most in favour now, is that which is called *equal temperament*. By this, the octave is divided into twelve equal parts called mean semitones. According to this arrangement, any note may be selected as the keynote and the music played without any extra devices.

Note	Tempered scale	Natural scale
C	256	256
D	287·3	288
E	322·5 ...	320
F	341·7	341
G	383·6	384
A	430·5	426
B	483·3	480
C	512	512

Strings in vibrating do not only swing as a whole but have also several secondary motions, each of which produces a sound proper to itself. A string when struck, vibrates first in its entire length, secondly in two segments, thirdly in three, fourthly in four, and so on. All these motions are simultaneous and the sounds proceeding from them are blended into one note. The lowest note is the loudest and is called the fundamental or prime tone and the others are called overtones, upper partial tones or harmonics. A note not accompanied by its harmonics may sometimes be sweet, but it is always thin and poor and therefore but little musical. Notes which produce harmonics are sweet and pleasing to the ear. Two notes whose ratio of vibrations is simple retain harmonics while blended and produce what is called concord. When the notes bear intricate ratios such as $\frac{16}{15}$, their harmonics neutralize each other and are disagreeable to the ear, emitting jerks or beats, so clearly audible in cheap harmoniums.

When a string is struck and touched in the middle, a note which is double in pitch, the octave of the fundamental note, is obtained. The string, in this case, vibrates in two parts in such a way that the point touched called the node remains at rest. Successively higher and higher notes can be obtained from the string by touching it at a third, a fourth, a fifth of its length and so on. In instruments like the Veena and the guitar, frets are placed at particular intervals to produce all the twelve semitones in the octave. In highly emotional, music when the mind is strongly agitated,

the notes shift their positions slightly forwards and backwards. In these altered positions which lie between the semitones, they go by the name of *sruties* or *microtones*. The late Rao Saheb Abraham Pandithar of Tanjore maintains among others, with much reason and force, that the sruties are 24 in number and their vibrations are as follow:—

Sa	....	240	P_1	....	349·37
Ri	....	247·03	P_2	....	359·50
R_2	....	254·28	D_1	....	370·13
R_3	....	261·72	D_2	....	380·98
R_4	....	269·40	D_3	....	392·16
G_1	....	277·30	D_4	....	403·63
G_2	....	285·41	N_1	....	415·46
G_3	....	293·78	N_2	....	427·63
G_4	....	302·38	N_3	....	440·16
M_1	....	311·23	N_4	....	453·05
M_2	....	320·36	S_1	....	466·34
M_3	....	329·76	S_2	....	480
M_4	....	339·41			

He divides these sruties again into ninety-six and points out that only a few of these are used in music.

Lastly, the phenomena of sympathetic resonance demand our careful consideration. If two strings of a musical instrument or of two instruments are tuned to the same pitch, and if one of them is struck, the other vibrates of its own accord. This fact is highly taken advantage of by musicians in enriching a musical note by adding to it several other resonators. Though the strings are not in unison, they act on each other when

they are harmonically related in pitch. In other cases, the vibrations of the one do not set the other in motion. The effect of a note on the plastic nervous substance is also of the same kind. The vibrations of the string or voice act on the nerves and readily attune them in such a way as to induce a musician to hum a tune quite involuntarily. The child's cry for fashion is an instance of the same kind. The swain's response to the milkmaid's song is also an example of sympathetic resonance, which extends even beyond the field of sound. A healthy environment gives rise to happy ideas and the sight of a merry face produces kindred sentiments. Apart from the function of the mind called the association of ideas, the physical response itself above described is largely responsible for the pleasure derived from the art.

CHAPTER IV.

The Nervous System.

The nervous system is the channel through which the vibrations of musical notes reach the mind and recoil on the muscles. It is the seat of all feelings. It receives, stores and communicates all impressions. A knowledge of its structure as well as its function is therefore essential to clearly understand how music affects both the mind and the body through the system.

The nervous system consists of two sets of nerves and nerve-fibres which are connected together. These are the Cerebro-spinal system and the Sympathetic system. The former consists of the cerebro-spinal axis composed of the brain and the spinal cord and the cranial and the spinal nerves with which they are connected with the axis. The latter consists of the sympathetic ganglia, the nerves which they give off and the various cords by which they are connected with one another and with the cerebro-spinal nerves. The spinal nerve consists of two branches—the sensory and the motor. The sensory nerve carries an impression to the cerebral organ and the motor nerve carries away that impression from the central organ to effect specific changes in certain portions of the body. Sometimes the cerebral organ enters into a state of activity without our being able to trace that activity to any direct influence of changes in sensory nerves. The activity seems to take its origin in the cerebral organ

and the movements to which it gives rise are called *voluntary*. Putting these cases on one side, it may be stated that a movement of the body or any part of it is to be regarded as the effect of a stimulus applied to the ends of sensory nerves, which set up a molecular change propagated from molecule to molecule along the fibres to the central organ with which they are connected. The molecular activity of the sensory nerve sets up changes of a like order in the fibres and cells of the central organ; from these, the disturbance is transmitted along the motor nerves which pass from the central organ to certain muscles. A similar disturbance is also set up in the substance of the muscular fibres, which contract and relax in various ways. Such a series of molecular changes is called *reflex action*. The eye-lids wink at a flash of light; the whole body starts at a loud noise; a sweet sound creates instantaneous pleasure; a bad smell causes a grimace. These are due to reflex actions. Reflex actions proper to the spinal cord are natural and are involved in the structure of the cord and the properties of its constituents. By the help of the brain we may acquire an infinity of artificial reflex actions, that is to say, an action may require all our attention and all our volition for its first or second or third performance, but by frequent repetition it becomes, in a manner, part of our organisation, and is performed without volition or even consciousness. "As every one knows" says Prof: Huxley, "it takes a soldier a long time to learn his drill—for instance, to put himself into the attitude of 'attention': but after a time, the sound of the word gives rise to the act, whether the soldier be thinking or not. There is a

story credible enough, though it may not be true, of a practical joker, who, seeing a discharged veteran carrying home his dinner, suddenly called out "attention" whereupon, the man instantly brought his hands down and lost his mutton and potatoes in the gutter. The drill had been thorough and its effects had become embodied in the main nervous structure."

The possibility of all education is based upon the existence of the power which the nervous system possesses of organising conscious actions into more or less unconscious or reflex operations. Also, it may be laid down as a rule which is called the *Law of Association* that if any two mental states be called up together, the frequent production of one of them will suffice to call up the other, and that whether we desire or not. The laws of reflex action and association of ideas are very important in music and we shall see how they give to the art the mysterious influence which belongs particularly to it. When sounds of varying curvature in pitch occur in music, emotions with which these sounds are associated in real life are called up and appropriately expressed by means of reflex action, giving rise to sighs, sobs, moans, laughs and even tears. The mind may know the artificial and unreal source of the musical sound full well, but it cannot control the muscle. We have seen persons (of whom the writer himself is one) who at the sight of mere representations on the stage are moved to tears without being able to control themselves. Many persons are also familiar with the object with which hideous yells are recently substituted for sweet notes of the horns of motor cars. Passengers are startled out of their wits more by the pain caused by

the reflex action than by any real fear of being run over by the cars.

Reflex action is a physical operation. It does not require the effort of the mind. In other words, it takes place quite unconsciously while association is a property of the mind—a semi-conscious process. When we hear a sound, an unconscious adjustment of the muscles takes place at once. It is after some time that the mind begins to act and search for the cause. We start at a noise and then think about it. We hear a musical note, yield to its influence reflexively, feel something and then try to discover its cause, which may or may not be known at all; for, these abstract feelings are effects disconnected from their causes.

Reflex actions are, as pointed above, of two kinds—spinal and cerebral. 'It has been shown that when the brain of certain animals has been destroyed, while the spinal cord and the trunk and limbs and their nervous connections with the spinal cord remained intact, the limbs may still be excited by appropriate stimulations of the skin to execute movements that seem to be intelligently directed. Thus, if a weak acid is put on the skin of a frog whose brain has been destroyed, the hind leg that can best reach the spot is raised and drawn across it as though with the purpose of removing the irritation. Such reflex actions seem to be completely determined by purely physiological processes. There seems to be no scope for the intervention of the mind as a directing agent.' In music, the same kind of reflex action takes place. Only the vibrations of notes originate from physical stimulations conveyed to the brain through the auditory nerve. We

are therefore concerned with cerebral and not spinal reflexes in dealing with music.

We shall now examine the structure of the nerve-fibre and see in what manner a stimulus applied to the sense-organ travels to the brain and brings about the reflex action. The nervous system is made up of an immense number of nerve-cells bound together by sheaths and strands of connective tissue. Each nerve-cell or neurone is an independent individual so far as its growth is concerned. It is the seat of metabolic processes of two kinds—the katabolic and anabolic. By katabolic process, a nerve-cell decomposes matter and gives rise to free energy and by anabolic process, it absorbs nutritive material from the blood. The function of the nerve-cell is therefore to receive an impulse by katabolic change and to conduct it from part to part throughout the length of its substance. As to the essential nature of the change, says Professor Mc. Dugal, we are still ignorant. Some authorities are inclined to regard it as a purely physical change such as the conduction of heat or electricity in wire or a fluid wave of pressure in a pipe, but it is possible that the conduction of impulse through each part of the neurone involves chemical changes of the same kind as those which initiate it at the spot stimulated. When the perepheral end of a nerve-cell is stimulated by a physical impression (sound) made on the sense-organ (the ear), the energy which is liberated thereby passes from cell to cell liberating more and more energy in the course of the passage. The flow of the impulse meets with a certain resistance on its way at the junctions of the cells called synapses. But by repetition of the

impulse the power of resistance decreases and yields to the inflow of outside impressions.

The work of the nerve-cells must be going on a rhythmic principle; for, rhythmic action is the life of Nature. Wherever we cast our eyes within or without ourselves we find regularity as her guiding principle. The Universe is controlled by it. The planets move round the sun in regular periods. The years roll on in regularity. The seasons, the tides, days and nights come and go in regularity. Birth, youth, old age and death, of men as well as the lower animals, together with the numerous organic changes marking their occurrence exhibit themselves in regularity. Even plant life, is bound up in its growth and decay by strict rules of rhythm or regularity—obedience to which means pleasure and life, and disobedience pain and death.

Again, embryology teaches us that in the mother's womb, the nervous system develops much earlier than the heart which begins to beat in the third or the fourth month. Consider the effect of its rhythmic beating. Blood is propelled throughout the body of the foetus regularly and its nervous system is drilled into discipline by means of the regular impacts of the blood-circulation. The soft, pliable and impressionable nervous matter is so much habituated to regular excitations that every impulse entering the body rhythmically from outside is received agreeably. Every irregular impact causes therefore a disturbance in the action of the nerve-cells and gives rise to a feeling of pain or uneasiness. Hence, a musical note which consists of regular vibrations massages, as it were, the nerves of

the body and gives rise to happy feelings while a noise causes pain by means of its thumping character.

Again, every nerve-cell in the body is, as it were, a twinkling little star. Though subject to the general control of the brain, it has its own specific function as seen before. Its vibrations are regular and independent, varying only when messages from the outside have to be transmitted. It is not however impossible to guess (within certain limits) the number of vibrations of these nerve-cells per second, at least of the auditory nerve-cells which serve the purpose of the musicians. All human voices, bass or treble, vary in pitch between 100 to 1000 vibrations per second, the middle C being 256. The cries of domestic pets or pests,—animals, birds and beasts such as the cat, the dog, the rat, the horse, the sparrow, the parrot, the monkey, the pig, the elephant, the lion, the cuckoo, the owl, the bee, the mosquito and the frog—the cries of these living beings lie within a limited compass. All sounds heard on this globe—not excepting those of inanimate objects—lie in a particular compass of pitch and the nerve-cells designed by Nature to receive such sounds must be of a suitable and reciprocative structure.

The vibrations of the nerve-cells are therefore not only uniform but of a particular intensity. A series of uniform excitations always produces pleasure. By uniform treatment as, for instance, by being stroked up and down regularly with the hands, a person can be put into a hypnotic or somnambulant state. Children are induced to sleep by being gently patted on the back or the head. By smoothly passing the hand over the body, a cat purrs, a dog wags its tail, a cow lowers its

head and raises its tail. A musical note in fact delivers very mild and gentle beats to the nervous system by means of its regular vibrations and hence induces one to sleep. The chief characteristic property of a normal musical note is therefore somniferous and pleasure-giving.

We must also note the difference between *intensity* and *volume* of excitation. A cut on the finger causes intense pain and the nerves connected with that affected part of the body only are set in vibration. But, in fever, for instance, the excitation is massive. The whole nervous system is affected. In the former case, a twig is affected while in the latter the root and branch are excited. The feeling aroused in music is always massive. The feeling affects the main source, namely, the brain and extends to all its ramifications in the body. Every nerve-cell is excited. Its action is quickened or retarded. If the modification is in consonance with the condition pre-existing, a feeling of pleasure ensues; otherwise, pain is the result. In either case, a very wide area of the nervous system is affected and a large quantity of energy is let off. The liberation of energy proceeds in a gradual manner. In certain excitations, as in intoxication, a large quantity of nerve-force is discharged and a feeling of exhaustion is felt; but in music the energy given out is so slow that the loss is always less than the supply and the sum total of the nervous energy is not diminished. It is this property that makes the art of music quite pleasurable in enjoyment and harmless in its effects.

The nervous system is also the store-house of impressions. A thought that enters the mind once does not simply pass from one end to the other. It leaves a

crease on the nervous matter. At the slightest irritation of the crease by any cause, as in dreams, the actual thought that caused it wakes up. If the crease is deep, the impression is permanent; otherwise, it disappears quickly. Impressions received in childhood are indelible. In other cases, impressions may be received as quickly as on wax and lost as easily. In music, a combination of notes formed in a particular manner resembles an emotional cry of man or animal and excites the crease caused actually when the cry was heard and the original feeling or thought is aroused. Musical notes do thus recall feelings of pleasure or pain by tickling the creases or impressions once caused on the nervous matter in daily experience. The more a system of music approaches Nature, that is to say, the more its elements, namely,—words and phrases, expressions and combinations of notes are borrowed from the material in Nature, the greater is its power to affect the heart through the nerves. To sum up, it is in the nervous system that sensitiveness to feeling resides and nothing can affect it so gradually, so smoothly, so gently and yet so effectively as music.

CHAPTER V.

The Mind and the Body.

The existence of a very close connection between the mind and the body, all have admitted; but, how they are linked with each other is scarcely known to any one. The theory of the soul intervenes and makes the subject more complicated. Is the mind an adjunct to the soul which dwells in the body or is it a cementing substance between the body and the soul? Such are the questions which entice the psychologist into unknown regions; but the musician need not get into these difficult philosophical problems. To him it is enough if he should confine himself to the phenomenal notion of a stream of thought accompanying a stream of cerebral activity. The introduction of the problem of the soul would make the psycho-neural connections only round about. He need only start with the fundamental fact that for every phenomenon in the world of consciousness, there is a corresponding phenomenon in the world of matter and vice versa.

There are five gateways of knowledge to the mind from the outer world. They are called the organs of sense,—the eye, the ear, the nose, the tongue, and the skin. Each of these organs has its own specified function of communicating the sensations of sight, hearing, smell, taste or touch. Loss of any one of these organs means that the mind is cut off from the outer world in that particular direction. Loss of the

eye, as well known, makes one blind and all sensations of colour and form are non-existent. One fact to be borne in mind is that there is no mutual help among these sensory organs. The eye will never do the work of the nose and perceive the smell of a rose, though its vision may become keener. It gains from the loss of the other organ. Blind people have a better sense of hearing than the sighted, though they cannot see the rays of even the midday sun. In fact, the sensory organs are so constructed and their nerves are so disposed that they respond to only one kind of sensation. Tickle the optic nerve, you get only sensations of light, tickle the auditory nerve, you get only sensations of sound. We have therefore to conclude that the adaptability of a nerve to a particular sensation whether sight, hearing or smell depends upon the disposition and arrangement of the nervous matter as well as the particular structure of the end-organ. If a healthy auditory nerve were to be cut and exchanged with the optic nerve, and objects of sight and hearing presented, no sensations of sight or sound would arise as though the person were deaf and blind. The functions of the sensory organs are therefore specific and limited. Through these, the mind is able to receive impressions and store them up in the brain. The mind is therefore entirely dependent on the body for its existence, growth as well as function. Drawing the materials of its knowledge from the external world, the mind governs the body as its master. It can steer the body for good or evil. It can work upon the body *en-mass* or in part. It can control its health and sickness. Goethe says—"It is astonishing what power our mind has over our

body. Let the mind therefore always be its master." Its main function is to be the guardian of the body to guide it on the right path and to contribute to its existence as well as the propagation of the species.

The normal condition of the mind is characterised by a feeling called *the vital feeling* which results from the effect of the organic functions on the brain. Single impressions do not stand out clearly but combine to produce a back ground of well-being or discomfort. When the body is healthy and all the organs are working automatically, a feeling of general comfort suffuses the body. The property and quantity of blood, the vigour of the circulation, the tension of the fibres, the abundance and scanty secretions, the relaxation, or tension of the muscles, the quick or laboured respiration, the normal or abnormal process of digestion—these all help to determine it without any one of them having occasion to stand out alone. How well we are able to hold our body erect, depends naturally on the energy at our disposal at the moment; and quite apart from all ideas, there is an immediate pleasure or pain, according as we are or are not equal, at the moment, to the said task. The feeling of ease and freedom is principally connected with the function of respiration and alimentation. Difficulty in breathing causes a feeling of disquiet and anguish. Nightmare is due to respiratory troubles. Many disorders in the bowels induce the same feeling. Nervous pains in the pit of the heart bring on a terrible feeling of anguish and weakness. Vital feeling therefore changes with health and sickness, with youth, manhood and old age.

Light and darkness may cause great changes in the vital feeling. Light is an essential condition of life. It promotes metabolism in animals. Light brings with it security, while darkness favours foes. The real basis does not lie in these associations. From the above details, it is clear that feeling is mainly connected with the bodily condition and not with the hours of the day or night. A person may be morose, joyous or sorrowful primarily according to the state of his bodily functions at any given time. Tooth-ache causes pain either in the morning or in the evening. Good news brings cheer either at day or night. There is no rhyme nor reason therefore in ascribing particular feelings to the different parts of the day though it may be stated generally that the mornings are bright and cheerful and evenings heavy and oppressive because of the previous state of rest or work. These vague feelings, however, at once make room for those which are caused by particular causes.

We have also to consider the temperaments of individuals. It is usual to distinguish four types of affective mental constitution— four temparaments. Minds of different temperaments differ in two ways, in the rapidity with which thought follows thought in the train of ideas and in the strength of the affection which colours the thoughts. The temperaments are named as follows:—Choleric, sanguine, melancholic and phlegmatic. According to the theory of Hippocrates (460-377 B. C.), the human body contains four humours— blood, phlegm, yellow-bile and black-bile. Gradually, each of these humours is connected with a tempera-

ment. It is now common to characterise persons as belonging to particular temperaments.

Temperament is due to the structure of the bodily organs; but vital feeling depends upon their condition. There are other feelings which are due to particular situations in which the body is temporarily placed without any reference to its organic structure. These may be feelings or emotions which soon overpower the vital feeling as well as the temperament. Both these are mental states and they bring on physical changes. In the case of the feelings, the physical expressions are very mild. They can be detected only with great careful examination; for instance, in sorrow, the features are lengthened, and the face falls. In sulkiness, the lips protrude as in pouting. In the feeling of superiority, the upper lip curls so as to show the teeth. In contempt, the eyes are half-closed. In disgust, the nose turns up. But in the case of the emotions, the bodily changes are violent and most marked. Vascular muscles are expanded so that a richer stream of blood is despatched as in blushing. The emotion may affect the lachrymal glands in sorrow, the bowels in fear, the liver in anger, and the respiratory organs in terror, so that the principle of psycho-physical parallelism fully asserts itself in all cases of emotions in a more or less marked degree. Parallelism, therefore, explains the fact that the physical change is proportional to the mental disturbance.

From the mere external expression, it is possible to guess the state of the mind. To look sad or merry or angry are phrases which indicate the principle of

parallelism. Though in the expression of the emotions the whole body takes part, there are special organs which express them to a very high degree of accuracy and faithfulness. These are the eye and the larynx. Both the look and the voice are capable of accurately reflecting the minutest shades of sentiments, feelings and emotions. Of the two, a clear voice which is the highest gift of God claims the first place. The vocal cords are very highly developed organs in the human body and play the chief part in the expression of feeling through music. They have a double function to perform. They have to serve the reflexes of feeling as well as the dictates of thought. The first is involuntary and the other deliberate. During speaking, the voice is mainly the instrument of thought. Under the influence of feeling, the principle of psycho-physical parallelism comes into operation and the voice exhibits such minute gradations of pitch as to serve the basis of music. It must be remembered that the vocal cords act only under a strong feeling or emotion. Mere tilt of the equilibrium of the mind does not produce any sound. Feeling must rise to a particular pitch, and then only does the voice proceed. Water must reach a particular temperature to boil. Similarly, in order to produce a sound through feeling or emotion, a particular degree of excitement should be reached. The lowest sound to be called musical (vide: page 17, para 2) should be of 16 vibrations per second and beyond 32,384, the sound ceases to be musical. The range of voice is very limited. By exercise, it acts as a relieving agent or safety-valve for letting out emotion. Emotional outbursts such as weeping, moaning and laugh-

ing and their artistic forms in music are soothing in the end; but speaking which the vocal cords produce at the command of thought is a task which soon exhausts the machinery. Speech involves irregular, jerky and vigorous action of the muscles which are strained while emotional utterances serve as lubricants. Speech combined with emotion loses its rugged character. In the case of a baby, the mind is in an undeveloped character and feeling serves as a guiding force. For every little desire, it cries. The cry varies in intensity, according to the feeling. In fact, the baby has feeling only and scarcely any thoughts. It is as years advance that the organism grows firm and gains strength; the principle of psycho-physical parallelism begins to gain strength. It is then possible to measure the states of mind by means of the voice and just as the face is the index of the mind, the voice may be said to reflect the mental condition. It is on the principle of parallelism that the Art of Music depends for its structure.

The law of parallelism becomes in operative in two cases: Firstly, when the temperament of persons based as it is upon the nature of the physical constituents of the body, is too coarse, there is no correspondence between the impression and the expression. Such persons are called 'deaf to particular stimuli' or dull or hard-hearted. Of music also, some do not feel the sweetness. The other class consists of persons who by means of mind-control have succeeded in restraining the action of the muscles, and have, so to say, become masters of themselves. The saint who has conquered his passions

yields to no temptation. He entertains no evil thought nor is he influenced by it. In him the law of parallelism fails to work. So is the mind of a butcher whom all pity has forsaken. An experienced actor also can control his muscle by mental training. He can inhibit or exhibit his passions as required by circumstances.

Generally speaking, mind and body are related together like the two wheels of a carriage. They move together in all their functions.

CHAPTER VI.

The Mind and its properties.

A knowledge of the operations of the mind is absolutely necessary to the musician. Some aspects of it, he ought to know much better than other persons. The following details chiefly relate to such phenomena whose study is indispensable to a correct understanding of the behaviour of the mind under the influence of music.

What *mind* is we cannot say exactly. It is an etherial being. Karl Vogt declared that 'as contraction is the function of the muscles and as the kidneys secrete urine, so and in the same way, does the brain generate thoughts, movements and feelings'. Thought must be matter or movement. 'Mind' is a mental substance, and the mental is the only reality; everything material, all movement in space, is but the outer form of mental life. 'Mind' is a fainter copy, a reflection of the body, says Homer. Lotze holds that mind has an independent existence in the world, but does not state anything as to its nature. He also expresses a spiritual conception of mind—an activity of thought. On the analogy of the cartilages which unite the muscle and the bone or the capillaries which unite the arteries and the veins, the 'mind' which connects the spiritual soul and the physical body together must partake of the nature of both.

The general function of the mind is clear. It is the

chief instrument which conveys to the soul or the ego all the impressions which are received from the external world through the senses. Musicians are, however, concerned directly with ear-impressions, and also eye-impressions by analogy.

There are three distinct mental functions known as feeling, knowing and willing; for instance, I see an apple on a tree; I may be affected by the beauty of its colour glowing in the midst of its cool green surroundings. Such a mental state of delightful admiration would be properly described, as a feeling or affective state; or again, if I happen to be a connoisseur of apples, my mind may be stimulated by the sight of the object to note its peculiar characteristics with a view to recognize the particular variety to which it belongs. Such a direction of mental activity would come under the head of knowing, cognitive process or intellection. And lastly, if I happen to be hot and thirsty, the sight of the apple may very likely excite a desire to pluck and eat it and prompt the corresponding action. And in this case, what goes on in my mind would be a process of willing, volition or conation.

Do these functions of the mind act simultaneously or one after another? If we compare our mental states at different times we find all the three functions are at work together. One of them preponderating over another. When we are suffering from tooth-ache intellectual consciousness appears to be suppressed and our mental state reduced to one of pure feeling. Every mental operation is constituted by the three functions which form, as it were, the tripod of mental life.

The mind may also be said to have three dimensions—length, breadth, and thickness. It always flows like a stream presenting various aspects of its contents, the form now of knowledge, now of desire, and now of feeling. Oftentimes the change of aspect is due to the nature of its flow, to the various obstructions present in its course. The stream of consciousness (as the course of 'mind' is technically termed, vide: page 48) may sometimes look stagnant or running, receiving the names of states and processes. Even when it looks quiet, the mind is flowing. Even during sleep, when the mind is not at rest, processes occur in the shape of dreams. Virtually, the mind starts at the foetal stage and empties itself in the ocean of death, taking in its course tributaries from various sources. We may now go a step further and state that the mind is cylindrical in form. A horizontal section would reveal that it consists of concentric circles placed one above another. Each of these circles consists of several ideas. Only one of them remains at the centre or focus and the others remain in the margin. Of these ideas, that at the centre is the most important. The nearer an idea is to the centre, the more it is prominent in the mind; the greater the distance, the more it slips into the unconscious regions. When I am reading a book, its contents occupy the centre. The sight of the book, its weight on my hands, the pressure of the chair on which I sit and the noise of the carriage in the street occupy different positions in the mind's eye which are farther and farther removed from the centre of the circle. When I look at the head, the feet occupy the margin; but when I turn my eye to the feet, the head goes to a corner, so

that when there are several ideas present before the mind, one of them is attended to in full, others in a lesser and lesser degree of clearness while some others escape the circle of attention. During a musical performance, when I attend to the vocal part of it, the instrumental retires to the margin and when I attend to the violin the drum recedes to the edge, though all of them remain in the field of consciousness.

One of the most important laws of the mind, is the law of Association of Ideas. When two ideas are firmly connected with each other, the remembrance of one of them automatically calls up the other. The idea of blue calls up the idea of sky or water because both sky and water possess the quality of blueness in them. There are various kinds of associations; association by contrast (giant suggests dwarf), by contiguity (sea suggests ships), by cause and effect (smoke suggests fire) and so on. It is as cause and effect that association operates in music. An emotion and its vocal expression are associated by nature. Particular emotions have particular forms of sounds as their external manifestation. A sigh is an expression of sorrow, and laughter of mirth. Sounds are the outward symbols of various feelings and they command the greatest wealth of shades for the expression of feelings. Even in the animal kingdom, a cry is at once the involuntary result of everything that makes a strong impression on the individual and a symbol for other individuals. The cry of pain serves as warning and enticing sounds attract sexes. Every note in music and its shade calls up by the law of association, a feel-

ing which affects the body though it may not readily yield to analysis.

It has been stated against music that it is indefinite in expressive power and that while a tune means love to one person, it means hate to another. It is necessary to study in this connection the nature of the mental function called Apperception. "Every impression that comes in from without, be it a sentence which we hear, an object of vision or an effluvium that assails our nose, no sooner enters our consciousness than it is drafted off in some determinate direction or other, making connections with the other materials already there, finally producing what we call our reaction. The particular connections it strikes into are determined by our past experiences, and the associations of the present sort of impressions with them. We never get an experience that remains for us completely nondescript; it always reminds of something similar in quality or some context that might have surrounded it before, and which it now in some way suggests. This mental escort which the mind supplies is drawn, of course from the mind's ready made stock. This way of taking in the object is the process of apperception. The selfsame person according to the line of thought he may be in, or to his emotional mood, will appercieve the same impression quite differently on different occasions. A medical or engineering expert retained on one side of a case will not appercieve the facts in the same way as if the other side had retained him. A dwelling house took fire, and an infant in the family witnessing the conflagration from the arms of his nurse standing out-

side expressed nothing but the liveliest delight at its brilliancy. But, when the bell of the fire-engine was heard approaching, the child was thrown by the sound into a paroxysm of fear, strange sounds being, as you know, very alarming to young childern. In what opposite ways must the child's parents have apperceived the burning house and engine respectively ?" A thief's fearing each bush an officer is also an instance of apperception. The fault lies not in the impression but in its interpretation.

Kshatriya's Padams are similarly taken to mean devotion by one set of critics, and sensuality by another. Western musicians have to take note of the above fact particularly as it is often expressed by most of them that music is indefinite in expression and that it hardly deserves the appellation of 'language.' They say, "music is indefinite in expression. What suggests to one the vicissitudes of war may suggest love to another." Here the defect is not of music, but of the mind. All looks yellow to the jaundiced eye, as they say.

CHAPTER VII.

The Stream of Consciousness.

In the previous chapter, the chief properties of the mind so far as they are present in compound states were discussed. We have now to trace its course in its simple state from the beginning to the end. Suppose I see an apple on a tree. In the act of seeing the apple what are the gradual steps through which my mind must pass till I *see* the fruit and acquire the idea *I saw an apple.*? If I wish to take up a book lying on the table, the arm which hangs loose on either side of my body in a state of rest, should be raised first, then bent, pressure applied and the book seized with the help of the fingers. In the act of *taking*, the hand must be capable of performing certain physical operations, such as moving, raising, bending, pressing and grasping. Whether I take a book, a watch or a pen, the hand must possess in it the ability to perform all the physical operations required to complete the act. In the same manner, the mind, to perceive a concrete object like an apple or an abstract quality like redness or a feeling like pain, must, by organic changes, be capable of performing certain elementary functions which follow one another in a regular manner. The stages in the movement of the hand are slow and visible. They could be followed easily; but the flow of the mind being more sudden than the flash of a lightning offers the greatest difficulty in examination. We

shall, however, study its stages both by analysis and synthesis, as far as possible.

The mind, like the hand, starts from a state of 'repose', that is to say, from a state, in which no impression (of any apple or any other thing) exists as on a clean slate. This is a quiet and peaceful state. It then becomes active and addresses itself to work. The mind at this stage 'sees'. Afterwards, it has to enquire within itself 'what do I see?'. After discrimination, it refers the thing seen to itself; that is to say, it appropriates the image to itself, thus, '*I* saw an apple'. During these stages, the mind undergoes several internal transformations in order to perceive the object. I am, I attend, what is it? an apple, I, I saw it, these five apparent stages which the mind should traverse before it can *see* a thing are known as *deep sleep*, *cognition*, *enquiry*, *egoism*, and *knowledge* in what is known already as the *stream of consciousness*.

The stream consists of two planes:—the sensuous or the lower plane and the rational, intellectual or the higher plane. They are in different positions in the brain. The sensuous impressions are confind to the lower centres while the rational impressions to the higher. These planes are more or less counterparts of each other and almost all the stages till now described, viz, repose, cognition, enquiry, egoism and knowledge have their duplicates in the higher plane so that it may be said roughly that we have discovered altogether ten stages, five in the lower and five in the higher.

At every moment of our life, we are having sensations, external as well as organic, entering our conscious-

ness. We may not be aware of them. A physical stimulus may act on the nervous system without a sensation arising; the sensation arises when the stimulus has reached a certain strength. It then emerges from the sub-conscious to the conscious plane. The state of repose at which the mind starts is termed as *the threshold of consciousness.* A conscious stimulus itself may by long application pass into what is called the subconscious plane. A reader may be wholly absorbed into the contents of a book or even other thought while he sees the letters and pronounces the words corresponding to them. The threshold is raised where there is not a great contrast to the preceding or simultaneous impressions. On the other hand, it is lowered under certain conditions. If a sound is listened to as it dies away, it can be followed down to a minimum strength inaudible to any one who has not followed it from the beginning. The threshold constitutes the borderland between the conscious and the subconscious regions. While unconsciousness is generally due to inattention, subconsciousness proceeds from weakness of stimuli.

In the flow of the mind from one stage to another, it is not necessary that it should halt, like a mixed train, at every station. In surprise, for instance, the mind takes long strides. In sorrow, its movements are gradual. "Like a bird's life" says William James, " the stream of consciousness seems to be made of flights and perchings. Let us call these resting places 'the substantive parts' and the places of flight 'the transitive parts' of the stream of thought. The main use of the

transitive part is to lead us to one or the other of the substantive parts." The mind of the lower animal is confined only to the physical plane while that of the human being traverses the whole course. It starts in the sensuous repose and ends in the intellectual repose. Some ideas may run only in the sensuous, some in the rational only and some in both according to their nature and intensity of the impression. Possibly, the higher we ascend in the scale of creation, the mind may become more and more free from the sensuous element and turn into one of pure knowledge and bliss as in the case of the higher spirits, angels and also of the Omniscient.

There are two principal elementary feelings known to all living beings—pleasure and pain. Pleasure is agreeable and every one wishes to acquire it and pain is disagreeable and every one tries to avoid it. The tendency to acquire the one and avoid the other is instinctive, being designed by nature for the continuance of life. Pleasure is constructive and pain is destructive. Both are positive states and one is not the absence of the other. The ordered and harmonious working of nature constitutes pleasure and disorder in its function produces pain. During the healthy vital condition, all the organs of the body keep on functioning in an unobstructed manner. So does the mind run in a smooth course. It sees, it enquires, it feels, it perceives in both the physical as well as intellectual planes. Its function is regular and hence healthy and pleasurable. If by any organic disorder or other cause, some trouble should arise to any or many of the stages in the stream,

the healthy vital feeling gives place to a painful one. The mind in consequence undergoes a certain recoil according to the nature of the pain. A few unpleasant stages then appear in the course of the stream. What are they? Between repose and wakefulness we experience a stage which inclines more towards pain than pleasure. If any one who is in sound sleep is suddenly aroused, he feels a semiconscious state of pain before he is fully awake. He prefers to drop back into sleep again. This unpleasant stage may be common to both the planes. Two additional stages now come to view. Again, we experience a feeling of pain even in the conscious state when our trials are thwarted and we feel mortified. This feeling comes just before or after egoism and there is reason to suppose that this element of consciousness, this unpleasant stage must also have a place in both the planes. We have thus found out altogether twelve stages—four painful and eight pleasurable—which are tentative and require corroboration by other means of observation.

All compound feelings such as magnanimity, pride or contempt are composed of the elementary sensations that are present in the stream of consciousness. For instance, in the feeling of power, egoism is the chief factor. In weakness, the element of pain plays an important part. In melancholy, the second semiconscious stage is at work. In sympathy, the stages of perception and enquiry are prominent. All feelings, moods and emotions,—benevolence, arrogance or obedience are mere compounds of the stages in the stream of consciousness. Emotions are particular states of

the mind. It is therefore possible to analyse an emotion into its component parts. In every case, the elementary mental states are responsible for the formation of emotions.

There is a difference of opinion between the oriental and the occidental philosophers as to the origin of emotion. The latter hold that emotions are *sui generis* and that an organic connection between emotion and emotion is not traceable and that it is in vain to try to reduce any one emotion in terms of any other and that a genuine, unarbitrary and inartificial classification of these mental phenomena is impossible. Mr. Bhagavan Das of Banares, in his *Science of the Emotion*, rightly points out, as representing the Eastern view, that a true classification of emotions is possible and that an organic connection and a genitive principle of evolution of the complex from the simple are traceable amongst them. Though his method is different from the one recorded here, a clear analysis and classification of emotions, in terms of the elementary feelings as expressed by the stages in the stream of consciousness is possible. Emotions are not *sui generis*. Every emotion must run through the same course of rise and fall. Its nature depends upon the particular stages present or absent in its flow. The stream of consciousness is therefore the origin of all feelings, moods and emotions.

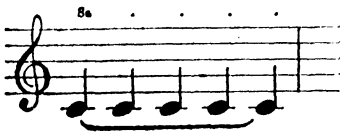
CHAPTER VIII.

Music and Consciousness.

It was stated in chapter VII that the mind flows like a stream and it exhibits the following stages in its course:—repose, disturbance, cognition, enquiry, egoism, pain, pleasure, disturbance, perception, enquiry and repose. In chapter II, we noticed that a scale of music consists of thirteen semitones. We shall here point out that every stage in the mind gives rise to a musical note under the influence of feeling and conversely, every semitone in the scale expresses an elementary feeling.

When the mind is engaged in an ordinary work such as walking, playing or solving a mathematical problem, it traverses through some or all the stages mentioned above. Only certain brain-centres connected with thinking take part in the work; but when a feeling of pain or pleasure enters into the thought, the activity of the brain-centres swells up and extends over the body and certain organs undergo particular changes. Among them the vocal cords play an important part. According to the law of psycho-physical parallelism, if the feeling rises, the voice rises; if the feeling falls, the voice falls also. Parallel to every stage in the course of the feeling (or emotion) we have one in the voice. This is a fundamental fact. The voice begins when the excitation reaches a particular degree, at a pitch which is neither too high nor too low,

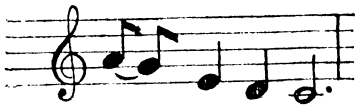
and to which man is accustomed while speaking. We have then the note C. If the voice is prolonged uniformly at this pitch a somniferous effect is produced. This note expresses an agreeable feeling of rest or repose which is the starting point of feeling. It represents the threshold of consciousness.

Compare 

This note should be used as drone in a sweet and mild form during the examination of the notes as described throughout this book.

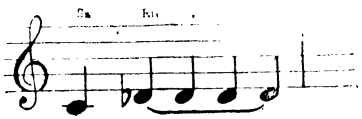
Western musicians use the tonic in the above sense but they do not seem to recognise its significance. "One may ask" says Miss Glyn, "what is the compelling power in the single tonic triad (Sa, Ga, Pa) that can attract all other chords towards it that they become mere satellites of the system?" Her answer is a variety of begging the question. "The truth appears to be," she replies "that the compelling power resides not in the triad itself but in the desire of the mind to return to it, the desire for orderliness." The compelling power, we do affirm, chiefly resides in the triad itself, in the physical property of the tonic which is present in the triad and which, like gravity attracts every other note towards it. In the tonic triad the other two notes reinforce the effect of the tonic by their similar nature. Generally, it is on C that every piece of music ends, giving rise to perfect cadence. It

is then only that the mind assumes a state of repose after the tide of emotion has passed.

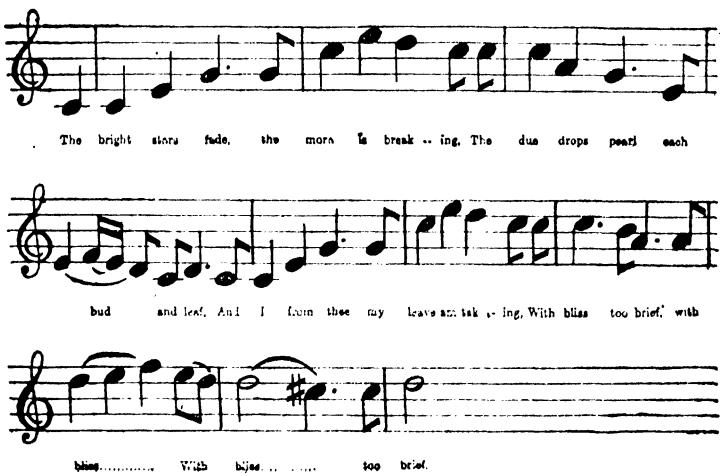
Compare 

God save the king

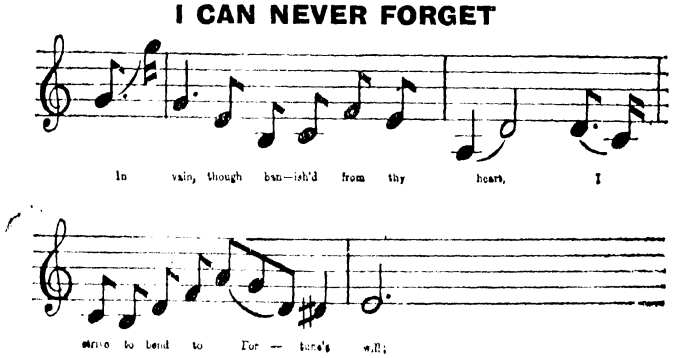
We now proceed to the next semitone Re flat (or C sharp). We find ourselves lifted up from a state of perfect repose to one of uneasiness or disturbance. We shall feel very happy if we can slip back into the original state of repose experienced in C. The second semitone expresses an annoying state which one, happily slumbering, feels when suddenly aroused. Compare



GOOD-BYE SWEET HEART



In the above passage, D flat (or in other words C sharp) is introduced in order to express a feeling of separation, especially in contrast with the higher note D. The third note (semitone) is D natural. It is free from disagreeableness. It expresses perception. In the act of knowing, it is the second natural stage. But when we go up to the next semitone, flat E, we meet with a feeling of painful remorse, distinctly keener than that experienced in D flat, as in the following,—



We were not able to observe the existence of this stage in the stream of consciousness in our introspection p. 51. One stage of uneasiness in the physical and one more, its counterpart, in the intellectual now emerge to our view. Proceeding onwards, we reach the note E. It is free from disagreeableness. It contains a mere feeling,—a softer one than in D—a tender appeal, a sort of enquiry or desire. The next note is F. It is also sweet. It expresses a feeling of self, courage and firmness.

Ascend still higher in the scale, we reach the most painful note F sharp. 'The scherzo of symphony No. 2

where F sharp chord is so suddenly taken and so forcibly held, might almost be a picture of the unfortunate Keller forced to stand still while the dish of stew was poured over his head.'

"In the dawn of consious life, ideas are but little clear and definite and the idea of self cannot therefore be contrasted with the idea of something outside the self, or of a different self. Pleasure and pain felt must almost wholly depend on what favours the preservation and development of our own being. Even the involuntary movements which do not involve any clear and distinct consciousness are more or less directed to such an end. There is manifested in these an instinct of self-preservation which is however far from perfect. In the involuntary movements of sucking and in disposition to put everything grasped into the mouth, may be recognized a tendency to refer everything to self as the centre.

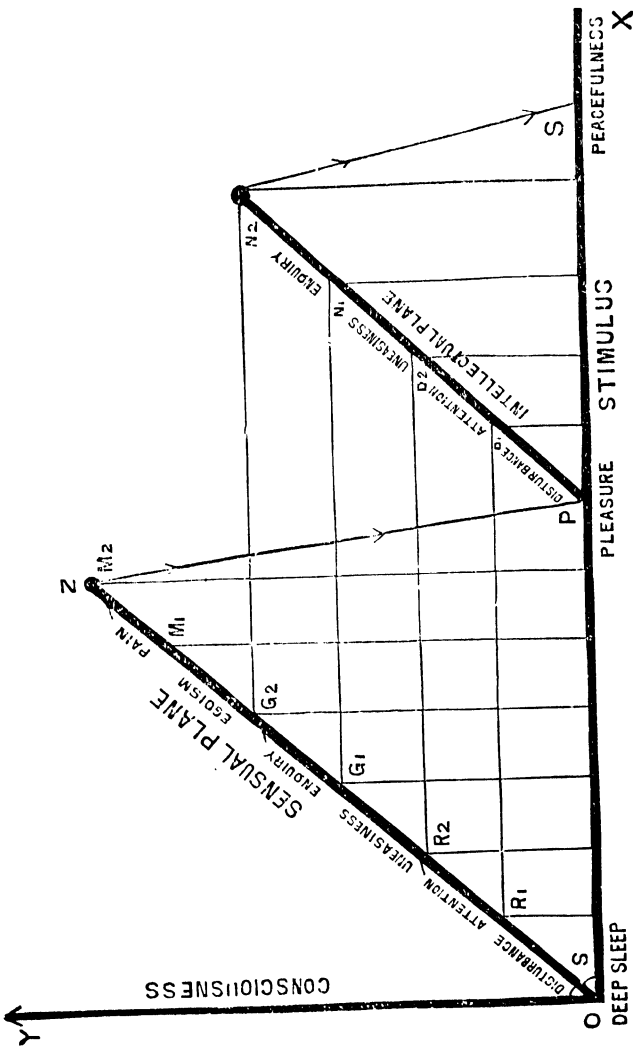
Now the feeling is determined by the idea of what promotes or hinders self-assertion, it will appear as a feeling either of power or powerlessness, according as we think we have or have not at our disposal sufficient means of self-preservation—power of making one's self felt. The feeling of powerlessness appears in humility, in repentance or in self-contempt which have their rise in the failure to obtain control over the condition of life which is recognized as desirable. Those feelings above named egoistic are linked with the individual self.

How is it, in general, to be explained that the individual may feel pleasure or pain in something that is not a means to his own existence? In this case, sympathy is explained as self-love. Self-love never rests quietly outside the self and lingers in the strange objects only as the bees with the flowers in order to draw from them what it requires.'—Hoffding.

These simple egoistic feelings of sympathy, powerfulness and powerlessness are expressed in music by E, F and F sharp respectively. This point will be further explained in the chapter on Ragas.

The next higher note G is bright sunshine after darkness. It signifies conscious pleasure. The feeling expressed by C is physical, but in G one feels fully conscious and one knows that one is enjoying happiness. Here begins the intellectual plane of consciousness. Higher stages in the stream correspond to those

found in the lower plane, viz, disturbance in A flat, cognition in A, sorrow in B flat, enquiry in B natural, and intellectual rest in the octave where extremes meet.



Psycho-physical parallism:—O is the origin. OX is the line of increase of stimulus and OY, of sensation. Sensation (feeling) varies according to stimulus (pitch of note.)

We now find that most semitones in the physical or sensuous plane have corresponding stages in the intellectual plane; but one stage, namely, that of pain is absent in the latter. Corresponding to F natural we have the octave expressing intellectual repose. The reason for this difference of stages in the two planes should be found in the design of the Creator which like the dissimilarity of the fingers on the hand is yet inscrutable to man.

In the two tetrachords composing the scale, there are (as shown in the above picture), seven semitones from C to G and only five from G to higher C. Our introspection made in chapter VII was not quite accurate. It needs modification in the light of the law of psycho-physical parallelism. Music (voice) and emotion (feeling) are like the back and front of excited life. We may look at the physical (the musical scale) through the mental (feelings and emotions) or look at the mental through the physical. Since the mind is fleeting and elusive, we are likely to go wrong. So it is safer to take our stand behind the physical and examine the operations of the mind by introspection. Thus viewed, there are twelve stages in the mind. They correspond to the twelve semitones in the scale of music, which is a sort of psycho-meter. Seven of these stages that constitute the Diatonic Major are agreeable and the rest are painful.

It is interesting to examine here the psychic properties ascribed to the musical notes both in the East as well as in the West. The natural notes of the standard scale, the Diatonic Major, are in the West generally

said to be agreeable in effect while the sharps and flats disagreeable. Shakespeare says:—

> It is the lark that sings so out of tune
> Straining harsh *discords* and unpleasant *flats*.

But this fact is overlooked in melodies. In passages, the design or intention shuffles all the notes together and the notes are used not according to their intrinsic feeling but according to their bearing on one another in furtherance of the so called Harmony. "Certain notes" says a western writer, "harshly dissonant if struck together as an isolated chord, produce one of the most beautiful effects in music when preceded and followed by certain other chords. This effect is determined by the context." Again, "certain passages occur in the device known as a Pedal-point which if heard as dissociated groups of chords, would sound excruciatingly inharmonious, but heard in their proper place with the introductory and concluding harmonies, not only detract from the beauty of the device but greatly enhance it." These assertions go to show that in western music, notes have no independent values or, in other words, elements in the world of music have no emotional significance. The compounds have some sense but it varies according to the context. The component parts of a discord may be beautiful while those of a concord harsh. "Beauty is not" says the same writer, "in the parts but in the significance with which they have been put together." No end would be served if the accuracy of the above proposition is called in question—though perverse it may sound to us. This much is clear that musical notes have no specific psy-

chological values. Their use cannot be considered apart from Harmony.

The very signs used for the seven notes, – A, B, C, D, E, F and G, borrowed from the word-language indicate the little attention paid to their artistic side. Notes exist only as the material of Harmony. The lowest sound in the scale is called the tonic; but any note may be used as tonic. The fifth degree is called the dominant, because it exercises the most powerful influence on Harmony. The third degree is called the mediant, because it is midway between the tonic and the dominant. The super-tonic D, and the sub-dominant F, the sub-mediant A, the leading note B and the octave—these names are given according to position in some cases and according to sense in others. How hazy is the appreciation of the notes with regard to their feelings! In no other art or science are the properties of the elements so woefully neglected as in music.

The Indian conception of the feelings ascribed to the various notes, though equally inaccurate is far more satisfactory. While in the West, vague values are attached to compound notes, namely chords, in India, compound feelings (emotions) are ascribed to the elementary notes, Sa, Ri, Ga, Ma, Pa, Dha and Ni, where Sa is the permanent tonic. The seven musical notes are said to be produced respectively by the seven living beings—the peacock, the bull, the goat, the heron, the cuckoo, the horse and the elephant. We wonder why, when simpler appliances could have yielded better results, a collection of living beings worthy of a zoologi-

cal garden should have been pressed into service in order to exemplify the pitch (not timbre which is unnecessary, nor emotion which is specified elsewhere) of the seven notes. Much, however, is made of the above by some apologists that the principal notes in the scale—Sa, Ma and Pa are, with high appreciation of nature, referred to the cries of birds; but it must be pointed out that so far as sweetness is considered, Ga is a better and more natural note than Ma, since it is heard very clearly as an overtone on the Mandara string and Sa, Ga, Pa form a perfect chord in the West also. Again, it is a sin to compare the discordant screech of the peacock to the most agreeable and sleep-producing note Sa. The clumsy frog croaks sweeter than the strutting fowl whose shrill cry is a mixture of cawing and mewing, ranging through many degrees in point of pitch. We have not heard the heron. The cuckoo has two ways of singing. When it is leisurely perched on some invisible branch in the midst of thick foliage, it gives forth a sweet piteous song which curves over a range of three or four degrees; but when pursued by a crow or its comrade, it jets out a series of broken notes of uniform pitch, suggesting in rich crispness the note of Panchama, but the notes of no two cuckoos, however, agree in pitch, and the same cuckoo raises its pitch if you were to mimic him. The goat, the horse and the elephant scarcely produce any sounds which in point of uniformity or relativity of pitch resemble respectively Ga, Dha and Ni or which could be called musical at all in point of sweetness. Even if we apply the *vadi*-test we shall be equally disappointed. Sa and Pa are said to be *samvadis* or con-

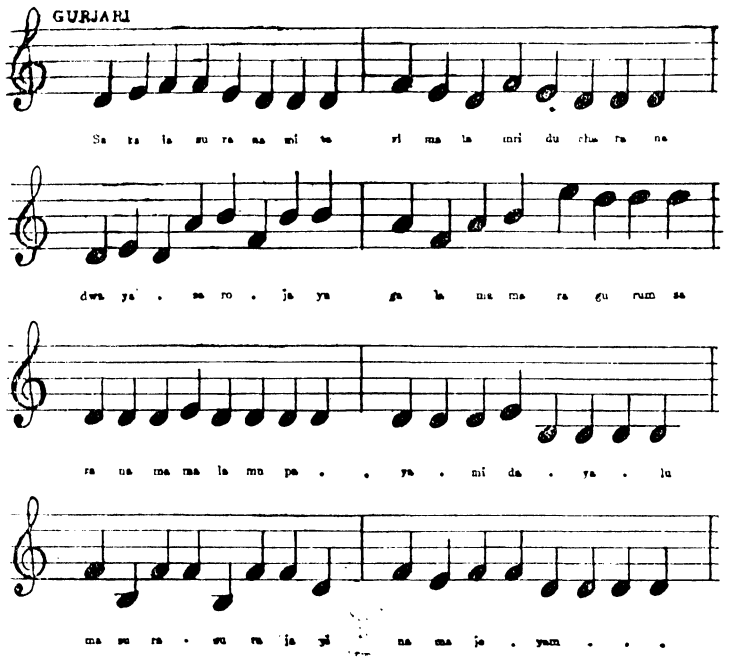
sonants. Where is the cry of the peacock and where that of the cuckoo? In point of emotion, Sa expresses heroism and Pa sexual love. Both are of the opposite kind. Take again Ri and Dha or Ga and Ni. Ga is the bleating of a goat and Ni of an elephant. The bleating and the roar are scarcely consonant. Thirdly, there are two R's, two G's, two M's, two Dha's and two Ni's which are quite contrary to each other in effect. These facts are overlooked in the standard works and it is not stated to which form of the note these cries as well as emotions refer. Fourthly, in certain Ragas a note cannot take its own consonant note lest their character should be spoiled.

Again, Sa is said to express valour, Ri wonder, Ga tenderness, Ma ludicrous, Pa sexual love, Dha disgust and Ni tenderness! That the notes of tenderness (Ga and Ni) could be higher in pitch than those of heroism and wonder (Sa and Ri) is contrary to experience. That the single note Pa could suggest sexual love or Dha disgust is also beyond all possibility. A musical note as we have often expressed can, by its natural property, please if natural or displease if otherwise and it can do nothing more. It is only by association of ideas that it can give rise to mixed emotions.

And again, the number of musical notes is seven, that of the rasas is nine. Ga and Ni are said to be of the same feeling. So we have to apportion nine rasas among six notes. In treatises in Sanskrit, as in Pratapa Rudriya, the definitions of rasas are given so clear and definite that no two rasas can ever exist together. That two notes Ni and Ga can express only

one rasa, and one note Dha can express more than one *rasa* does not stand to reason. The statements found in Indian treatises on music regarding the notes and their feelings do not deserve any serious consideration.

Finally, a combination of these notes made in Ragas cannot give rise to the specific emotions attributed to them. Let us take an example of a Raga from Ratnakara and examine its significance.



The flow of the notes is quite rudimentary in style. Both Sa and Pa are absent; but the emotion ascribed is *vira-roudra-adbhuta*, *i.e.*, heroism and wonder. How can we get heroism when Sa itself is not in the compound? If Ri should make it heroic, there is Ga to soften it. Ma and Dha should add the comic and the

disgusting ingredients. A mixture of such emotions and the inferences drawn therefrom, appear to us to be without rhyme or reason. Let us see if the words at least set to music, convey any idea of the emotions ascribed to them? When translated from Sanskrit the meaning of the passage is:—

> I seek the protection of the Almighty who is invincible, who is the Lord of the Asuras and the Devas, who is merciful, who is the preceptor of the Devas, and the pair of whose lotus-feet, being soft and pure, is adored by all the Suras.

What is the emotion expressed in the above words? Is it wonder or heroism? Neither do we find in them. Reverence, Meekness, Humility, Submissiveness, Homage, Adoration, Worship—such emotions may be attributed to the passage.

To conclude,— the emotional or psychic values attached to the musical notes both in the East and in the West are devoid of any scientific or logical basis and no satisfactory result can, we affirm, be ever obtained unless the natural relation between the stream of consciousness and the musical scale is thoroughly understood.

The names such as sleep, disturbance, enquiry, &c, given in this treatise to the feelings expressed by the musical notes may appear as diverse in nature as heroism, wonder, ludicrousness, &c, enumerated in Sanskrit works. It must therefore be borne in mind that the English language is poor in psychological terms. The names are expressive only in a very general manner. All the feelings described herein arise only from one cause, viz, the condition of the nervous matter brought about by the strength of the stimulus. They are subjective; they become objective when turned outwards and attached to particular situations.

CHAPTER IX.

Weber's Law of Relativity.

In chapter VIII, we examined with the aid of illustrations the elementary feelings expressed by the musical notes and found out that they are respectively, repose, disturbance, cognition, uneasiness, enquiry, egoism and pain in the sensuous plane; and knowledge, disturbance, cognition, uneasiness and enquiry in the intellectual plane ending with repose. We shall here study to some extent the physiological basis of these feelings.

In the course of performing their natural function of assimilation, the neurones are always in a state of vibration. They also receive, more or less a regular impact from the perennial stream of blood circulating in the capillaries. The nervous system is thus induced from the embryonic state of the body to responding to regular vibrations. It therefore receives a musical impression which likewise consists of regular vibrations with all the warmth as well as agreeableness of kinship.

Again, all activities in the body go on at a particular rate and this rate generally remains constant if a feeling of ease and comfort has to be maintained. There is also a limit to the number of vibrations. The heart of man beats 68 to 70 times in a minute. His lungs contract and expand nearly sixteen times in the same time. His legs take him only four miles per hour in walking. The pitch of his voice is comprised within two to two and a half octaves and the middle C is the

convenient note on the side of pitch for most human beings. The normal rate of the vibrations of the neurones of the auditory system may therefore be guessed with the help of the principle of the physico-neural-parallelism, to stand somewhere between 240 and 280 per second. This number varies, it is true, in different individuals. But it cannot be much. The pliable nature of the nervous substance accommodates itself to changing conditions and a slight difference in the number of vibrations does not matter much. So, the same feeling of repose ensues, whether C consists of 200, 210, 220 or even 270 vibrations. But if a note of high pitch is heard, the mind very quickly perceives it, even in the absence of a moderate note to compare it with, as when the shrill whistle of a distant railway or mill engine is heard. In such cases the nervous system feels the sound quite repulsive on account of its intensity. There must therefore be a normal rate of vibration for neurones as stated already.

But when once the normal rate is established it must ascend or descend in a fixed ratio. Man, for instance, is accustomed to walk four miles an hour. His steps fall, say, two feet apart. If he is made to walk with steps either too short or too long, a feeling of intense pain is the result. Again, during walking, the right hand moves with the left foot and the left hand with the right. If one were made to walk with the right hand swinging with the right leg or the left hand with the left leg, the same feeling of discomfort would ensue. On the other hand trotting at six miles or running at eight miles per hour would be easier

than the abnormal mode of walking. In the human frame as in the case of many other living beings, from the biggest organ to the tiny little nerve-cell, a particular mode of functioning is prescribed by nature, if a feeling of ease and comfort is desired. In the words of Hoffding, the eminent psychologist—

"The antithesis between pleasure and pain is coincident with the antithesis between free and impeded progress towards an end. Unimpeded progress is pleasant in proportion to the intensity and the complexity of mental excitement. An activity which is thwarted or retarded by the presence of positive obstruction or the absence of co-operative conditions or hindered in other conceivable way, is painful in proportion to the intensity or complexity and to the degree of hindrance."

Hence, when the normal rate of vibration is established, that is to say, when a note of 240 vibrations is fixed as above, a note of 241, 242 or 243 heard at the same time produces a jarring or painful feeling, but if the number increases to 270, 320 or 360 or 445, the nerve-cells obtain a greater freedom of movement and give rise to agreeable sensations as when the notes D, E, F, G, A and B are heard. But when the vibrations are 256, 288, 337½, 384 or 432, some hindrance to the free vibrations of the neurones is caused and we obtain the painful feelings expressed by the flats and sharps,—F sharp and D, F, A and B flats. The ratios of vibrations of agreeable notes are expressed by the simple fractions as ½, ⅔, ¾ and so on, while those of discordant ones are more complex.

When a music string fixed on two bridges is struck a note called the fundamental note is produced. It is also accompanied by higher notes called its harmonics. The open note is the loudest and the harmonics are

heard very low. If the string is touched gently at one-half, one-third, one-fourth and higher distances, the pleasurable notes are distinctly heard while the flats and sharps are heard, if at all, with considerable difficulty. These facts go to show that pleasure results when the variation is in simple harmonic numbers.

"The physiology of pain" says William James, "is an enigma. One might suppose separate sensory fibres with their own end-organs to carry painful impressions to a specific pain-centre, or one might suppose such a specific pain-centre to be reached by currents of overflow from other sensory centres when the violence of their inner excitement should have reached a pitch. Or one might suppose a certain extreme degree of excitement to produce the feeling of pain in all cases."

With the aid of music it is easy to ascertain the nature of pain and get over the doubts expressed by the learned professor. Play a melody on any instrument, and if, at the same time, a different key, say a semitone higher, is struck and held on for some time as drone, the same melody, sweet though it was before, sounds quite out of tune as long as the new key is sustained. Even to an untrained ear it causes intense pain. The sensation of pain now felt is not due to the activity of separate nerve-cells or to any overflow of feeling, but it is due to the disturbance caused in the system by the adoption of the second key after removing which the original state of happiness would return. One set of nerve centres for pain and another set for pleasure is contrary to the economy of Nature. Feelings, therefore, are only the outcome of free or hindered functional activity of the bodily organs.

It is observed by several critics, "The C of one scale may be D in another expressing repose in the

former and cognition in the latter. That one and the same note should express two different feelings is a clear proof that no specific psychological values could be given to the musical notes." We must refute with the help of the Law of Relativity, the above belief which has caused many an earnest student of music to give up as fruitless every attempt to ascertain the psychological values of musical notes.

"The same excitation" says Titchener, "under different circumstances produces the sensation, now of warmth, now of cold. If for example the hand is placed in a vessel of the same temperatue of the room, a temperature to which it is accustomed warmth is felt because the radiation of heat from the hand is prevented in the smaller space. If one vessel is filled with the water of the temperature corresponding, the second with water of a higher, and a third with water of a lower temperature and if the right hand is dipped in the second and the left hand in the third vessel and both together in the first vessel, the right hand will feel cold and the left hand warm in the first vessel where previously neither would have felt cold or warmth." There is no series of absolutely independent sensations but every sensation is determined by its relation to the one experienced immediately before it or at the same time. The law is known as the Law of Relativity. Hence one and the same note expresses different feelings in different keys. But when a melody is bodily raised in intensity by raising the key we shall find that the effect remains the same.

Also as Titchener says "A sensation may remain the same and yet vary in intensity. A pressure may be pressure of an ounce or a pound, but it is still pressure, one in quality but its strength differs. Hence there arises an interesting question—the question whether if I add to the amount of stimulus, the heaviness of the weight, or the strength of the sound, or to the illuminating power of light, I add in equal measure to the intensity of the sensation? Of course, the strain of carrying three pounds is greater than the strain of carrying one. But is the strain sensation in the first case three times as strong as the strain-sensation in the second? The answer to the question is given by what is called Weber's Law.

Suppose that I have laid a pound weight in the scale and measure out a pound of sugar. If I add another pound weight, I must have twice as much sugar to balance the scales; if I add a third pound three times as much sugar, and so on. Now, suppose that I am measuring not sugar but the sensation of pressure. A pound weight on the skin gives me a sensation of pressure and

two pounds gives me a stronger pressure—let us say P + p. Will three pounds give me P + 2p? Experiment says no. If my pressure sensations are P, P + p, P + 2p, P + 3p, then the weight must be 1, 2, 4, 8lbs. These results are embodied in what is called Fechner's Law.

(i) The increase in the strength of the sensation resulting from an increase in the strength of the stimulus, depends not on the absolute increase but the relation of the increase to the preceding stimulus.

(ii) The strength of the stimulus must increase in Geometrical progression in order that sensation may increase in Arithmetical progression.

The usefulness of the law is clear. We can find our own way about in the world, recognise our clothes, books, furniture etc, as well on a dull day as on a most brilliant sunshine day. The relation of brightness remains the same in all cases and a difference that is relatively the same for stimuli is absolutely the same for sensation. It is the same principle that enables us to recognise the musical melody although it may be played in quite a different way from that in which we are familiar with it."

The following inferences are drawn from the above.

(i) Every musical note when judged by itself expresses a feeling of repose, provided that its pitch is neither too high nor too low so as to physically exhaust the nerves.

(ii) When a key is fixed, notes express the particular feelings described in pages 57 and 58.

(iii) In relation to any other key, the same notes express a different feeling. If the key now selected is one semitone below, namely B, the F sharp in the first key now becomes G, and expresses pleasure instead of pain; and if a third key is selected, two semitones higher, it becomes E and expresses a feeling of enquiry—an agreeable, sympathetic feeling.

The sensations produced by notes during modulation are quite bewildering as those experienced when one colour is produced after another so as to dazzle the

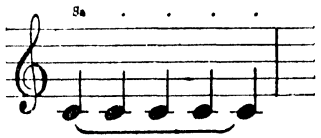
eye when rockets explode in the sky. During the period of modulation an interchange of intervals between the notes of the scales takes place leading to a difference in the feelings of the notes. The plane of consciousness is tilted and the whole operation is rendered agreeable as well as perplexing just like the peculiar sensation felt when a car or a carriage takes a rapid turn at the change of direction of a slanting road. Modulation is a device which in Western music is used to produce a great artistic effect causing wonderful changes in the psychological values of notes.

CHAPTER X.

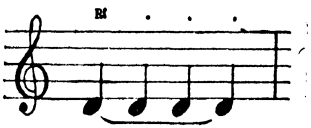
The Keynote or Sruti.

We pointed out in the previous chapter the importance of the tonic and its property of inducing the mind into a state of repose. We saw also that the keynote should be kept continuously sounding when the feelings expressed by the other notes in the scale have to be tested. We shall study more of the same note in the present chapter.

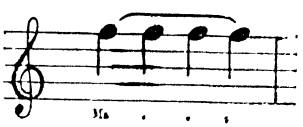
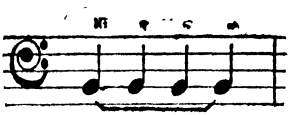
Every musical note pleases the mind and leads it into a state of repose because it consists of regular vibrations and every note C, D or E has the same quality when struck in a manner isolated from the other notes and judged by itself.

For example 

is as agreeable and as pleasing as



But, if a note is too high or too low, we have a feeling of exhaustion or even pain.

 or 

The feeling of exhaustion caused in these notes is due to their shrillness or lowness. "The moderate stimulation of the central nervous substance is attended with pleasure and the pleasure continues with the increase in stimulus up to a limit of fatiguing activity at which point, it gives way to a feeling of pain" (Hoffding)

Hence, the proper tonic lies between the two extremes and at a moderate pitch which does not tax the vocal cords of the singer or the tympanum of the listener and does not charge the nerves with inordinate excitement. When a person talks loud, we ask him not 'to yell like a devil'. In music also the tonic should be generally as high as the ordinary speaking voice to which one is always accustomed, though the slight variation of a degree or two does not matter much. Since all the sounds heard on this sphere on which we live, animate and inanimate, fall within a limited compass of two or three octaves, the selection of a convenient tonic is possible for all systems of music. Accordingly,

the C of the Paris	Conservatoire is about	258·7
,,	Concert Pitch	269
,,	Italian opera	273
,,	Society of Arts	264
,,	Handel	249
The shadja of Indian Music is about		256

The mind takes a tonic of this pitch as comfortably as breathing fresh air. Under its influence, the nerve-cells vibrate in the normal manner and give rise to an agreeable feeling which gradually leads to a somniferous condition. When such a note is heard a certain resist-

ance is, at first, offered to its stimulus at the junctions of the nerve-cells or synopses but the resistance is soon overcome. The effect of the stimulus lasts for a few seconds even after it is removed and unless the tonic is struck again before the cells recover their former state, the succeeding note should again do the spade work and overcome the resistance of the synopses. But when the keynote is sounded as a drone, it will not only plough the nervous substance but maintain it fit to receive the notes of the melody in a befitting manner. It is for this reason that an air played with the tonic used as drone appears (or rather sounds) as brilliant as a picture with a beautiful back-ground.

But, "A prolonged pleasurable stimulation results in a gradual falling off in the intensity of pleasure. A similar result shows itself in general in the case of painful stimulation. The reasons for the general subsidence of feeling when excitation is prolonged are to be found partly in the lowered functional activity of the nervous structures engaged, partly in the falling of in the reaction of attention. Prolonged pleasurable stimulation, if powerful enough, issues not in a dulling of feeling, but in the transformation of a pleasurable into a painful mode of feeling. This is an illustration of the general principle of nerve fatigue. Even when the prolongation of a previously pleasurable sensation does not beget the full effect of nerve-exhaustion, it may result in a minute weariness which arises from a consciousness of the decline. This effect is seen in the state of Monotony."

Let us see if the drone is monotonous. The first

item that an Indian musician attends to before singing is to select a convenient pitch for his keynote Sa, so that he may easily run over the whole compass of the melody. "Perfectly constant and uniform impression and states" says William James, "do not come into consciousness. They are not accompained by sensations. The pressure of the air on our body is noticed only when it varies. The very rapid movement of the earth carries us round without our knowing it. A substance affords sensations of taste only if its taste is different from that of the saliva." In the same way, the drone, in Indian Music, always remains in the subconscious region. It does not cause any nerve-fatigue. It rises above the level only when it gets out of time. Serving as a background, it throws the notes of the melody into relief and emphasises their feeling by relativity and thus adds to the general effect of the whole performance. In polyphonic music in which several notes are sounded at the same time, the key is constantly suggested by the chords themselves and the necessity for an expressed key is not so much felt.

Even when a series of painful impressions—auditory, visual or tactual—enter the mind in a rhythmical manner, they are attended to only for some time. The nervous system reconciles itself to their influence. Attention also becomes weaker and weaker till the impressions recede into the physical plane and hover over the threshold of consciousness. The sound of th ewheels when work is started in a mill oppresses our ears at first, but after sometime the impressions also retire into the back-ground. We attend to them only when the

impressions cease. In a journey by rail, we are aroused from sleep when the train comes to a standstill; so does a mill-owner wake up when the spindles come to rest. Monotony arises when attention has to direct itself continuously to one and the same impression which in itself is an end but not a means to the furtherance of a mental process. The drone used in Indian music is only the ground-work on which the superstructrue of a melody rests and as such it is no monotony to one who is acquainted with the elements of music. An oriental monarch ignorant of English once attended a London stage when Hamlet was enacted. Asked as to how he liked the performance, he muttered, "Really grand was the show; but the young man appeared too often and was boring." The character of Hamlet so interesting to an intelligent audience was a bore to the distinguished visitor. Thirdly, an object not interesting in itself may become, as Professor James states, interesting through being associated with an object in which our interest already exists. "The associated objects grow together, as it were, the interesting portion sheds its quality on the whole." The fly of the shuttle is pleasing to the weaver, though monotonous, as it means money to him. The screen on which pictures fall in a Cinema is attractive for a similar reason. Mrs. Cousins like several European critics of Indian music is unaware of the above physical as well as psychological facts when she remarks that "Sa which he (the author) postulates as peace or sleep but which another person might easily consider monotony far removed from pleasure." To her, the tonic is monotony far removed from pleasure.

It may be pointed out that Indian musicians were ignorant of the use of tonic-drone till the 16th or the 17th centuries. The division of Ragas into Jatis by Bharata (8th century) goes against the existence of the drone. Even in Saranga Deva's time (13th century) the influence of the tonic was unknown. In point of feeling, no note was considered as expressing a state of repose. Melodies started on any note designated as Graha and closed on any one called Nyasa. The variation of Jatis was unfavourable to the adoption of a fixed tonic. It was during the later fusion of the Hindu and Muhammadan arts, that these stilts (Graha and Nyasa Swaras) were removed and music took a firm stand upon the tonic Sa as the basis.

Again, when affected with emotion, the voice bursts into song at a pitch which varies according to the intensity of emotion. When a thorn pricks my foot or when one knocks his head against a wall or when news is received by wire of the death of a dear one, the voice does not scientifically start on the tonic. The Graha swara, the starting note may therefore differ according to circumstances—according to the severity of the shock. But the closing note, always ends on the tonic as the cry of pain does not stop till the mind has spent up its feelings. It comes to a state of rest, like a stone thrown upwards coming to the ground only after its energy is spent up. Technically the starting note is the same as the closing note quite in accord with the natural condition. In modern music, the Graha and Nyasa swaras are always the tonic Sa. In western music, the close called the cadence is of

two kinds:— the true cadence and the false cadence. The former ends on the tonic (Sa) of the mode and in other cases, called the medial, false or interrupted, the mind stops abruptly in various states of suspense and anxiety like a sentence ending with a comma.

It must be admitted that the use of a fixed key, scientific though it is, has tied the Indian musician form straying to higher or lower planes of consciousness by means of modulation. The transposition of key for the sake of emotion is quite natural and the Indian musician is denied the pleasures of this artistic embellishment. A mother mourning over the loss of a dear child bursts into weeping in a higher key at the sight of friends. A public speaker transposes his speech to a higher key when asked to address "Louder please". Happy lovers engaged in idle talk lower the key of their voice at the intrusion of strangers. Western music has a very great advantage over the Indian art in this respect, and by means of related keys, melodies are conveniently raised or lowered bodily according to requirements.

Fixed key in Indian music has also operated as a check upon the development of Harmony. Adoption of different keys would have favoured collective singing and driven the artists to the necessity of fixing up concordant and discordant grouping of notes. But this device is often abused in western music by mediocre artists and keys are changed merely to compensate for the baldness of melody or to reach a particular sharp or flat by a sort of elephantine movement which modu-

lation facilitates. In such cases, what may be called exaggeration of feeling is the result.

Great care has therefore to be taken in the selection of a proper drone. It must be of a very fine colour. The best drone is furnished by a well-tuned Tamboora. The drone of the South Indian Nagaswara is very rough. So are the notes of the cheap harmoniums. The drone of the Scotch bag-pipe is also powerful. A drone of agreeable timbre, well attuned to other instruments, like the cool breeze on a summer evening or the fragrance of jessamine in a flower garden, adds a very great charm to a musical performance.

CHAPTER XI.

Moods and Modes.

A Raga or mode is a melodious arrangement of musical notes in an octave so made as to express a definite mood. It is no arbitrary series of notes. The word Raga is derived from Sanskrit Ranj = to please, aesthetic pleasure being implied. From the mood, different emotions arise.

The difference is very often forgotten between aesthetic pleasure and actual pleasure. Art is therefore mistaken for real life. Pleasure in art arises from the faithfulness of representation to Nature and the artist's skill involved in its production. Even painful scenes and events represented in art appear beautiful and art lends a colour and interest even to painful occurrences. All tragedies are attractive for this reason and so are several Ragas in music. This distinction should be clearly borne in mind in judging the effect of Ragas.

The fundamental mood is the mood of nature,—mood of health, growth and happiness. Such are the moods of Jivas or souls, as well as inanimate nature. The mood of the Almighty according to Indian philosophy is one of bliss. It is a gladsome mood specially favourable to the development of bright happy thoughts. It depends upon the healthy vital feeling. Such a mood is expressed in music by the natural notes,—C, D, E, F, G, A, and B, constituting the scale of the Diatonic major which corresponds to *Dhira-Sankarabharana Raga* or Bilaval.

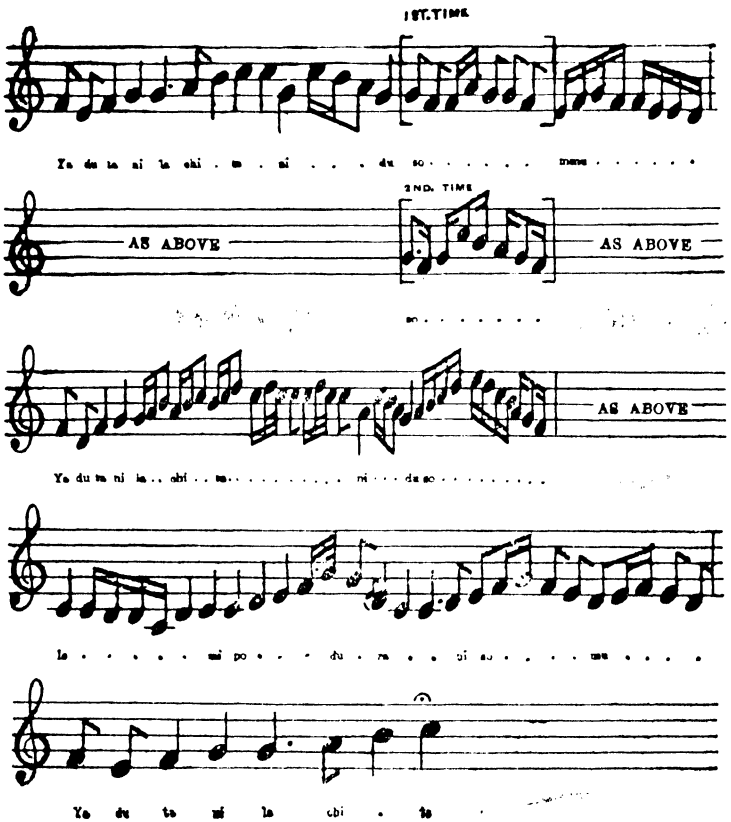
This scale is a meeting place on the side of pitch not only of the East and the West as Miss Glyn says, but it is more. It is a meeting place of God, man and Nature, of spirit and matter. Sankarabharana means the ornament or attribute of *Sankara*, the doer of happiness, the name being, in this particular case, very appropriate. The mood of the Raga corresponds to that described by Shelley in the following lines:—

> The joy, the triumph, the delight, the madness,
> The boundless, overflowing, bursting gladness,
> The vaporous exultation, not to be confined!
> Ha! Ha! the animation of delight,
> Which wraps me, like an atmosphere of light,
> And bears me as a cloud borne by its own wind.

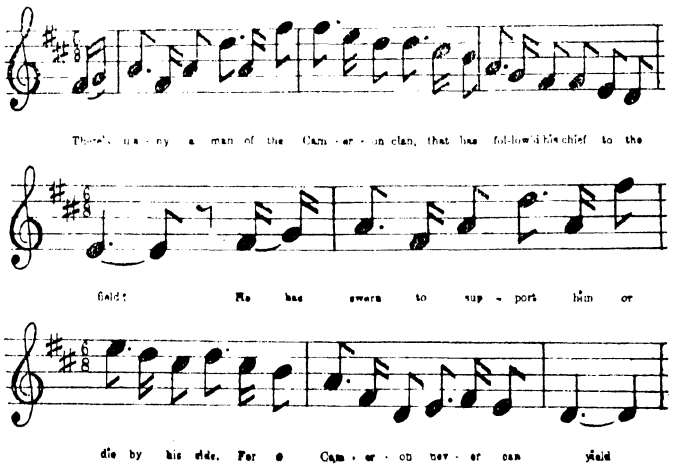
From the time of Bharata, 8th century, discussions are rife as to which of the Ragas or modes is *Sudh* or natural, and which is the best way of classifying them. Sarangadeva gives about 264 Ragas under the two Gramas, taking the Kafi *That* as the natural scale. Mukhari is adduced as its rival by some. Kanakangi is given as Sudh by Venkatamakhi. Sankarabharana is also mentioned by others. But who with any knowledge of emotion of Ragas could doubt in the least the pre-eminence of Raga Sankarabharana? So the Raga has established itself as the natural scale of the whole world. It is not a 'Survival of the fittest' as Dr. W. H. Cummings, late Principal of the Guildhall School of Music, seems to think. It is the root and the other modes are its offshoots.

A mood is almost passive. When it ferments, it becomes emotion or passion and finds expression in physical response. Mood is the sum of the elementary

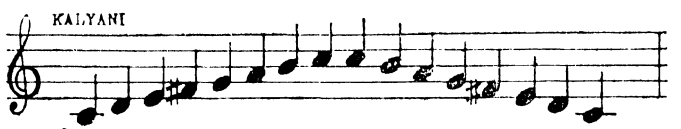
feelings and emotion is their outburst. Mood is a calm sea and emotion, its commotion under a storm. Emotion is like a fit of intoxication and mood is brooding over an idea; or again, mood is like a bird in the nest and emotion, when it is on the wings. Shelley's description of cheerfulness quoted above represents emotion better than mood. From the mood of Sankarabharana arise such emotions as heroism, magnanimity and such others which call forth the exercise of physical energy under happy and healthy circumstances. For examples, compare the following in the same Raga.



2. The March of the Camerons.

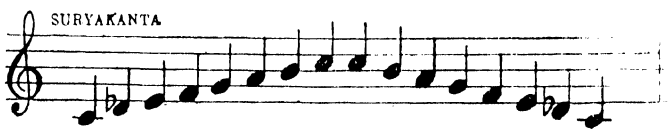


We shall now proceed to determine the primary moods of the mind. The mood of Nature, the gladsome mood, is expressed by Raga Sankarabharana. The opposite mood is that of powerlessness. This mood is represented by Raga Kalyani in which F sharp takes the place of F natural.

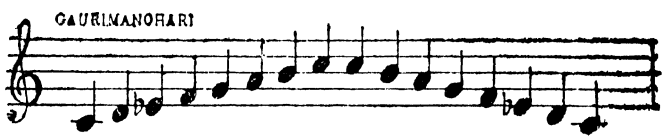


Raga Kalyani which is popularly believed as auspicious is not really so; for, powerlessness is its prevailing feeling. Its effect is not quite apparent since only one out of seven notes expresses pain. When F sharp is held on for a length of time, the real mood comes to light.

In the stream of consciousness, we saw that to attain the stage of 'knowledge,' the mind has to pass through the stages— I see, I enquire, I feel, I know. When the mind proceeds without let or hindrance through all these stages both in the sensuous and the rational planes, we feel happy; the Raga Sankarabharana is then produced. But if there is an obstacle at the stage of egoism, the mind passes through powerlessness, takes F sharp instead of F natural and gives rise to Raga Kalyani. In the same way, if the first stage of 'I see' is affected, the mind passes through D flat instead of D natural and the Raga we get is Suryakanta.



If, on the other hand, the third stage, namely, 'I enquire' is affected, E flat takes the place of E natural; we get the Raga Gaurimanohari.

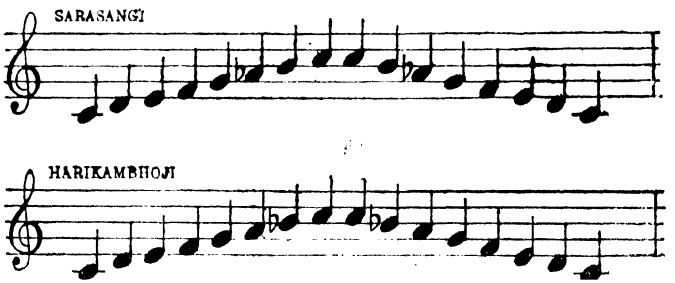


Ragas Suryakanta, Gaurimanohari and Kalyani are derived from the fundamental, healthy, gladsome mood of Sankarabharana when obstruction is caused successively to the various stages in the sensuous plane in the stream of consciousness. The flow of emotion

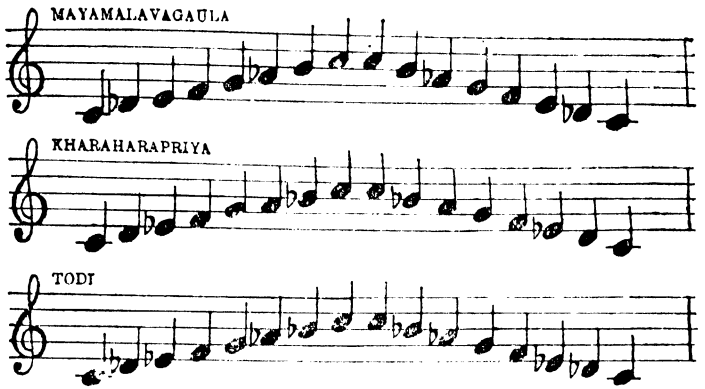
from the altruistic E to the egoistic F is so precipitous that there is no room for the intrusion of any obstacle between the two stages.

When an obstacle is met with in the stream, a note may become sometimes sharp and sometimes flat. So the sharp and flat forms of one and the same note do not appear in the same Raga. We may take the second semitone as D flat or C sharp, neglecting the hair-splitting question of 'sruties' for the present.

If, on the other hand, an obstacle is caused to the stream of mind only in the rational plane at the several stages, we have Ragas Sarasangi and Harikambhoji.



All these derivative Ragas or modes expressed by Suryakanta, Gaurimanohari, Kalyani, Sarasangi and Hari Kambhoji are composed of seven psychic elements of which only one is painful. The nature of the pain depends upon the intensity of the note as well as its relative distance from the tonic. Now, the higher and the lower planes of mind run, as we saw before, parallel to each other, and when there is an obstacle to a stage in the lower plane, its corresponding stage, (vide fig. page 58), in the higher plane is sympathetically affected and vice versa. Such symmetrical moods are more natural and smooth-flowing. They are represented by Ragas,———



In Kalyani, the disturbance is exactly in the centre and there is no note in the scale corresponding to F sharp to be sympathetically affected. Hence the Ragas or modes simple and therefore very popular with the singers are Sankarabharana, Mayamalavagaula, Kharaharapriya, Kalyani, and Todi, in all of which painful and pleasurable stages are symmetrically situated and in singing which the mental and physical adjustments afford no great resistance. But in singing such Ragas as Sarasangi, Suryakanta, Gaurimanohari and Hari Kambhoji, an act of inhibition is involved. When the note D flat is produced, its counterpart in the higher plane, viz: the A flat is affected. Some difficulty is experienced while moving through the rational plane in which the mind has to reject a proffered note and adopt another. Hence the physical difficulty in singing Ragas in which notes are unsymmetrically distributed makes their feeling also painful and such Ragas are rarely used in practice.

The division of Ragas into seventy-two root-Ragas (page 12) made by Venkatamakhi is the best when

tested in the light of Psychology. Of these Ragas 1 to 6, 31 to 42, and 67 to 72 are seldom used in practice as the notes are most inconveniently distributed in the scale. They are very painful in execution. Of the remaining 48, one half becomes useless for the same reason. Among the rest only a dozen Ragas are used in art as the notes in them are conveniently situated. The great musician Tyagaraja composed songs in all the seventy-two root-ragas. So did Maha Vidyanatha Iyer; but these yield no real pleasure either to the singer or to the listener. Like an acrobat's walking on his hands with the legs turned up to the sky, the compositions are admired only for the display of physical skill involved in their execution. The very fact that the kritis of even Tyagaraja composed in such complex Ragas have gradually gone out of use is a proof of the truth of the above assertion.

Many more root Ragas may be formed as derivatives; but they are still less useful than some of those specified by Venkatamakhi. Some scholars in southern India have with the least considerations of psychology raised a storm in a teapot recently in condemning the classification of root-Ragas into seventy-two. Venkatamakhi's method is certainly the most logical, though his Prakriti and Vikriti notes are not all such. It must not be demolished because some of his Ragas are uncommon. Why cut down the vocabulary of a language because some words are difficult and rarely used? The Karnatic music will, if such attempts should ever succeed, lose the advantage of a codified Raga-system and fall into the chaotic condition existing in Northern India.

Out of the 72 root Ragas, only a dozen are really useful, and artistically valuable. These facts go to show how shallow is the cry of certain enthusiasts that Indian Music is stagnant and that musicians do not *invent* any more new ragas, when in the field of melody, every conceivable Raga does fall under those already explored. In Nothern India, several hybrid-ragas are brought into existence even by great artists; these are mistaken for new ragas. This process is going on in Bengal also. The work of an artist is not to create new ragas (there are no ragas to be created). He has only to create new modes of expression out of the material at his disposal. Neglect of emotional considerations in music has led many a scholar astray and committed him to strange and wonderful propositions which have no legs to stand upon.

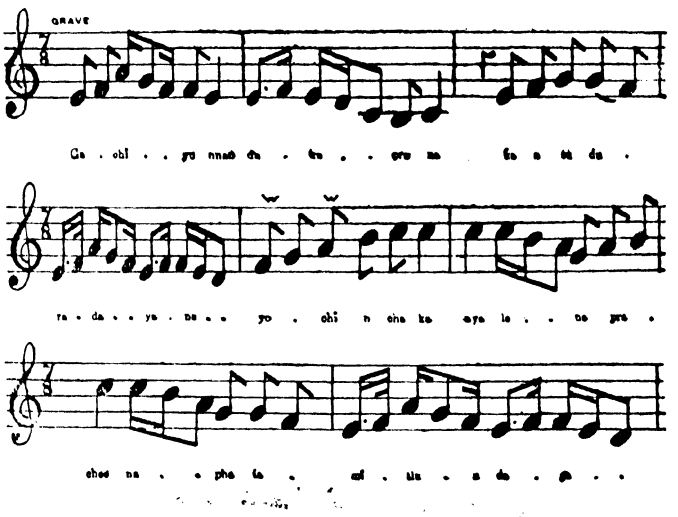
In any classical Raga, constituted on strictly scientific principles, no two notes of the same denomination, as now found in Bhairavi, Behag or Khamas, ought to be used, however sweet their effect may be. It is true, as Mr. Chinnasamy moodaliar points out that such notes, like stolen kisses, make the Ragas sweet and attractive. If we wish to be members of an enlightened society, pleasure ought not to be the sole aim and to steal a kiss would be a crime. This is true in Art also. A certain standard of morality, even in art,—of close adherence to certain fixed rules is absolutely necessary in order to prevent the degradation of love into lust. Examined in this way, Nothern Indian music suffers much and knows no strict allegiance to rules of Art. The formation of new Ragas

whether made by a Tansen or a Tyagaraja should be examined in the light of psychology before adopted for execution.

We explained above that the Raga Sankarabharana expresses such feelings as heroism and majesty. The words of the krithi printed on page 83 are addressed by a bold devotee thus,

"Oh God, you (certainly) do not lose
any jewel if you stand before me."

But how is it that in the same Raga Sankarabharana we experience emotions which sound more sorrowful than happy? compare 'Gachiyunnanduku' below.

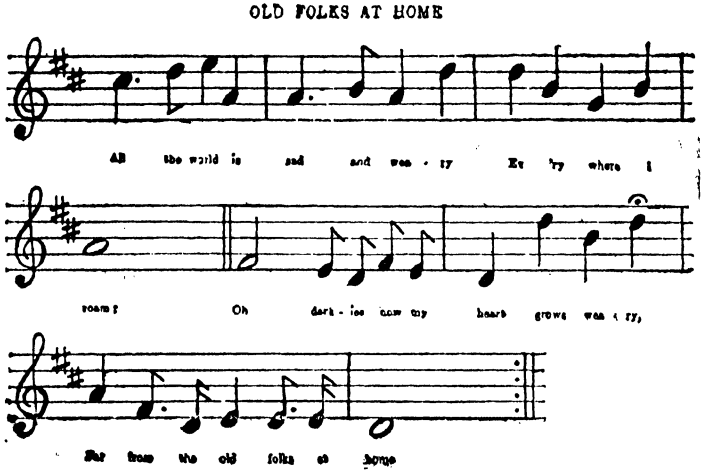


The words are spoken by a lady,—

"Though I waited long, the lord of my life did not come. Why should I feel sorry when my fate is such?"

Or contrast the March of the Camerons (page 84), with the Old Folks at Home,—

Way down upon the Swany river,
Far, far away
There's where my heart is turning ever,
There's where the old folks stay.



To explain this apparent inconsistency, we have to study here at some length the behaviour of the mind under the influence of mixed emotions. Professor Titchener says:— "Though it is stated that two opposite affections cannot ever be in consciousness together and the total feeling of a given moment must either be pleasant or unpleasant, we find many references in poetry and fiction to mixed feelings,—emotions that are at once pleasant and unpleasant. Juliet says,—

Parting is such sweet sorrow,
That I shall say good night till tomorrow.

The question of the existence of mixed emotions is an old one in psychology. When a man is afflicted for the loss of a law-suit and joyful for the birth of a son, the mind running from the agreeable to the calamitous

with whatever celerity it may perform the motion, can scarcely temper the one emotion with the other. That is, there is a see-saw of joy and sorrow, according as the situation confronted is that of the loss of the suit or the birth of an heir. Professors Hume and Sully are of the opinion that in such cases there is a rapid see-saw of the attention between the situations. This is not correct. We have a very good example of the situation in the Antony and Cleopatra— "This grief is crowned with consolation." The mixture of the emotions is not like the mixture of two medicines when one drop of the one unites with another drop of the other, either cancelling the effect of the other or adding to the other. The truth is that the stronger emotion settles down on the mind and the lighter floats at the top like the consolation crowning the grief. Suppose the loss of the suit is so serious as to ruin the living of the person; the birth of the son though joyful produces no effect. If it is not serious, the joy of the birth of the son will be prominent. It is true that each colours the other. It is not possible that they can alternate and introspection tells us that they do not."

We perfectly agree with professor Titchener in the above view he holds of mixed feelings. When there are two or more emotions agitating the mind, the strongest of them overpowers all the others and then establishes itself in the mind firmly as a mood. The weaker ones now float at various levels at the top. Suppose a person, waking up early in the morning, finds that his house has been broken into and a valuable jewel stolen. He frets and fumes over the acci-

dent for sometime and ultimately reconciles himself to the loss which however now resides in the mind as a mood. It keeps on preying on his mind during the day, if not longer. He becomes pensive and grows cold to his occupations and even food may not taste well. A frown is visible on his face. The fault of the cook is avenged on the syce and his other innocent subordinates also go in for a share of his wrath. Suppose in such a mood, a dear friend happens to pay him a visit. He composes himself as much as he can and welcomes the visitor with all seeming joy, talks to him and sends him away, showing a merry mood on the top of a sorrowful one. Here we have two opposite feelings—sorrow at the loss of a jewel, and joy at the visit of a friend. The latter being weaker disappears as soon as the visitor withdraws. If instead of the visit of a friend, he had sustained another loss or injury, the original mood would have blended well with the second and burst forth with redoubled vigour. Like emotions produce a cumulative effect while unlike ones inhibit each other. We have seen in our own experience that from one and the same mood as back-ground, several similar or contrary emotions may arise. A sickman in a melancholy mood exhibits the greatest heroism when teased. Coming to appearances, we have so many instances in which men conceal their real moods and exhibit different ones outside. To dissemble or to pretend is to mean one thing and act another. "One may smile and be a villain." "All that glisters is not gold." Real character is hidden under the cloak of etiquette, and the character of a person is revealed only by living at close quarter. On the stage, one

and the same person now appears as a king, now as a woman, and now as a servant. The devices he uses for such apparent changes in appearance are colour, dress, gait and speech. In music, the following factors, if differently used, contribute to giving rise to mixed emotions.

1. Massiveness
2. Timbre
3. Form
4. Grace
5. Language
6. Pitch
7. Rhythm

We shall separately deal with the nature and effect of these devices in the following chapters.

CHAPTER XII

Janya or Derivative Ragas.

The devices mentioned before give rise to emotions which appear contrary in kind to the original mood, the emotions being expressed by means of one and the same Raga to which the original mood belongs. But the particular kind of Raga through which a mood itself bursts depends upon temperament and constitution (page 36, para 2). The same stimulus may lead to different degrees of reaction in different individuals. One weeps bitterly at the loss of a dear one, while another consoles himself and ends in mere regrets, while a third remains indifferent. Ebullition of emotion depends therefore most upon mental culture, strength of character and physical constitution. It is therefore possible to infer the character of a person by the Raga expressing his emotion or to state the Raga which a person of known character would adopt to express a particular emotion; just as it is within our experience to know how a person would take the breaking of some news, good or bad to him.

Judged in this light, it must be said that the lady whom we found (in page 90) pining for the return of her lover is a most virtuous lady. Her love to her lord is infinite. She is doting upon him; yet, she is calm, courageous and faithful. Her main object is to please him and derive comfort in his pleasure. His absence, though long, does not discourage her. She puts her

faith in divine dispensation and brings reason to soften her misery. It is this temperament that has led her to Raga Sankarabharana. She is bold and firm like Portia who says,—

> "If I live to be as old as Sibylla, I will die as chaste as Diana, unless I be obtained by the manner of my father's will."

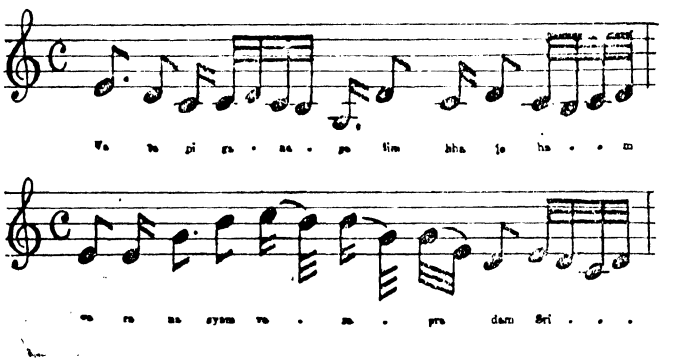
She is no Miranda of 'piteous heart' in The Tempest to say,

> "If by your art, my dearest father, you have
> Put the wild waters in this roar, allay them.
>
> ....Oh I have suffered
> With these that I saw suffer."

and to lose courage and adopt in her expression F flat instead of F natural constituting the Raga Kalyani. If she were still more desparate like Juliet, the pain expressed in F Sharp would have reacted upon her powers of cognition and perception and given rise to Raga Ramapriya or Varali. The same inference applies to the weary traveller who is longing to see his 'Old Folks at Home.' Ragas represent such delicate shades of emotion. They may be root-Ragas or derivatives. The former point out the genus of emotion while the latter make them more general. It is after a mood finds expression by means of a Raga that the seven devices to be explained hereafter operate and help to give rise to apparently inconsistent emotions.

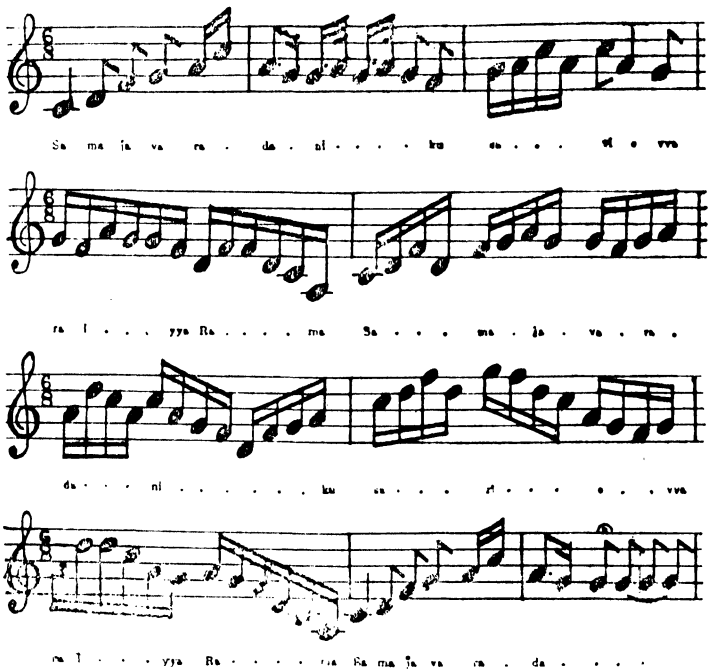
In page 59, we found that the musical scale is but the sound-form of the stream of consciousness and that the root-ragas are formed by combining seven particular stages chosen from among those that

compose the stream. These stages occur either consecutively or by leaps, according to the nature of the emotions of Ragas. One interesting question that now suggests itself for consideration is this,— Do the elements of consciousness exist in emotions in a state of mechanical mixture as oxygen and nitrogen in the air or of chemical mixture as calcium and oxygen in lime? In other words, does an emotion bear the feature of each and every element? Can one element be separated from the rest without spoiling the mixture? By an examination of the Ragas it is not difficult to infer that moods are mere mechanical mixtures of psychic elements. From Raga Sankarabharana, for instance, omit F and A, we get Raga Hamsadhwani. The elements of egoism and higher perception are absent in this derivative raga. The emotion becomes selfless in character and rapid in flow. Sympathy, love, charity and pity are expressed in it better than majesty, boldness and such other egoistic emotions present in the parent Raga. Example:—



Again, instead of F and A, eliminate E and B, we get Raga Sudhasaveri. Its feeling is of an aggressive kind.

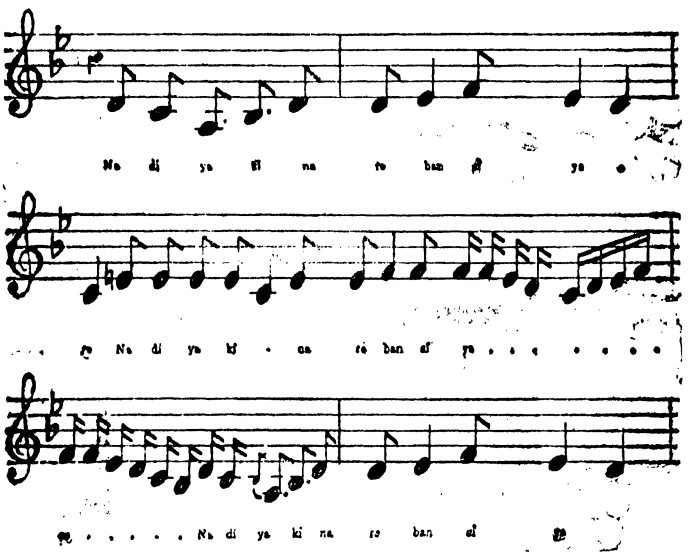
Conceit, haughtiness and self-importance are expressed. It lacks the dignity of Sankarabharana as well as the tenderness of Hamsadhwani. Compare Samajavarada,



In all Ragas, notes are therefore in a state of mechanical mixture and the omission of one or two notes deprives them only of the corresponding elements of feeling without altering the nature of the original mood. Even where the notes are used simultaneously, as in the chords, the feeling bears the stamp of its elements so clearly that in a chord also as in a Raga we have a mechanical mixture of the elements of consciousness. Derivative Ragas are formed by thousands and the emotions they express are very subtle in nature. Psychology is too poor (not sufficiently advanced

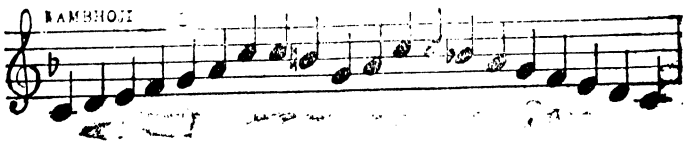
to provide them with proper names. So they are roughly classed under pleasurable and painful emotions. The peculiar feature of these derivative Ragas is that they are rapid in their flow. They do not admit of being sung slowly. Being quick in movement they only appear to be spirited in expression. The emotions expressed by root-ragas are massive while those of derivative ragas are accute.

There is a class of derivative Ragas which take both the forms of one and the same note. Such are very few in number in the Karnatic system though under the influence of Hindustani music they are increasing day by day. Khamas, Behag and Kafi are examples.



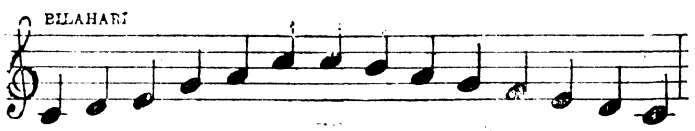
Though purely Karnatic, such Ragas like Begada, Attana and Nilambari take two forms of the same note owing to the confusion that crept as to their parentage during the period of transition from the early to the

modern music and also to the subtle nature of the emotions they express.



The emotions expressed by such Ragas are very pleasing since the contrasts between hindered and smooth passage of feeling find artistic expression in them. A feeling passes from one kind to its opposite. "The hindered passage of craving, as that of hunger to the pleasure of satisfaction, from sickness of paito uhealth and enjoyment, from the misery of poverty to the delights of wealth is a theme of remark in every day life. Conversely, the transition from health to sickness, dignity to shame constitutes a well-known subject of pathetic emphasis". Hoffding.

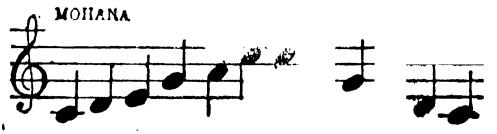
When the notes used in the ascent differ from those used in the descent, a further complication in the nature of the emotion is introduced. Example,



In Ragas like the above, the nature of the emotion in rising differs from and even contradicts, the same in falling.

The parentage of most derivative Ragas which contain five or six notes is of a doubtful nature as the

notes are common to more than one root-raga. For instance, Raga Mohana



may be derived from (Dhira) Sankarabharana or Mecha-kalyani. In such cases, the mood of which the emotion is an effervescence differs according to the particular parent-raga to which it is traced.

Massiveness is therefore an important factor which disguises, if not alters, the nature of the emotions expressed by the Ragas.

The terms Root and Derivative as applied to Ragas are only relative. The evolution of Ragas follows the evolution of emotion. The fundamental feeling is one of 'shanti' or repose which is expressed by Sa. The principal harmonics of the note give rise to the Diatonic major or Sankarabharana whose emotion is health, happiness and bliss. Flat and sharp notes in the scale are also obtained as harmonics, and these give rise to the other root-ragas. Sankarabharana is the first to originate from Sa. Then follow the rest as its variations. The so-called Ganya Ragas are therefore derivatives of derivatives, since all the Ragas may be directly or indirectly traced back to one fundamental note. How well does this accord with what the Poet Bhavabhuthi states in his famous drama Uttara Rama Charita!

> There is only one feeling, namely, karuna or pathos.
> By various causes, it gives rise to different emotions.
> The ocean is naturally calm and tranquil;
> Bubbles, eddies and waves appear when a storm tosses it.

CHAPTER XIII.

Timbre or Colour.

Timbre or colour is the quality of a musical note by which we know that it proceeds from a particular musical instrument or from a living being. By means of timbre, we distinguish between the voices of different persons as also between vocal and instrumental music. But for variety in timbre, life would have been a comedy or even a tragedy of errors. The voice of a friend would have been mistaken for that of a foe, the voice of a woman for that of a man or an animal. The roar of the lion would have passed for the mewing of a cat and a chaos whould have ensued in the absence of timbre, though pitch would have gained much in its power of significance.

There are two aesthetic emotions—'The Beautiful and the Sublime' which deserve a separate place in the treatment of all the Fine Arts. Burke, Alison, Payne Knight, Hume and many ancient Greek Philosophers also have written at length upon the nature of these emotions and the part they play in giving rise to pleasurable sensations. Alexander Walker says, in his book on *Beauty in Woman*, "The characters of beauty or prettiness, with relation to ourselves, are smallness, subordination or subjection. Hence female beauty in relation to the male. The characters of grandeur or sublimity with relation to ourselves, are greatness, superordination or power. Hence male beauty

in relation to female." Payne Knight says:— "All degrees of magnitude contribute to beauty in proportion as they show objects to be perfect in their kind". It may be said that physical littleness contributes to emotion of beauty, and physical superiority to sublimity. Nothing is sublime that is not vast or powerful or does not make one feel sensible of its physical causes or moral superiority. The simplest cause of sublimity is presented by all objects of vast magnitude or extent, a seemingly boundless plane, the sky, the ocean, etc, with the ideas of height, breadth of resistence, depth of danger and the simplest cause of beauty is tenderness. In music, we are concerned only with sounds. Nature has so designed her works generally that a beautiful object has a beautiful voice and a sublime object gives forth a sublime sound. Storms, tempests, hurricanes, earthquakes, eruptions of volcanoes, the roar of the lion, of the elephant are all sublime. Man's voice is sublime and that of a woman is beautiful. The song of the cuckoo and the nightingale, the cooing of the dove are also beautiful, while those of the donkey and the crow are ludicrous. Exceptions to this rule do exist in nature as in the case of the peacock, but they are very rare, being neither sublime nor beautiful. A man with a woman's voice or a woman with a man's voice are disgusting.

It must be noted that the same object retaining the relative proportion of its parts changes its nature from the sublime to the beautiful and vice versa when its dimensions are changed. An elephant excites sublime feelings while a parrot arouses beautiful ones.

Suppose the elephant becomes smaller and smaller till it can rest on your palm and the parrot grows bigger and bigger till you find that your hand can scarcely reach its tail. What change in the nature of emotion do the elephant and the parrot undergo in your mind? They have crossed the ordinary standards of size. They have changed places. The elephant becomes beautiful and the parrot sublime. A baby excites tenderness; a person of the same age begets friendship and a Hercules draws forth our admiration. Gulliver was feared by the Lilliputians but fondled by the Brobdignagians. Sounds in music become significant by the association of ideas. When we hear sublime sounds we at once infer that they proceed from a mighty person or object and when they are beautiful we attach them to tender persons.

Let us now divide the musical instruments according to the quality of their timbre. Generally, stringed instruments are beautiful, those of percussion are sublime. Instruments of wind are beautiful as well as sublime. To be more definite, the veena, the guitar and the lyre have beautiful sounds. The trumpet and the bassoon give out sublime sounds. Bass notes are sublime and soprano ones are beautiful. It now becomes clear that to express a particular emotion we should select particular instruments. Suppose the story of 'Androcles and the Lion' is set to music. What instrument should be used to bring out the full effect? A bassoon or a trumpet should echo the roar of the king of the beasts while a flute or a violin would suit the voice of Androcles whereas in 'The Lion in love,' we should change the flute for a lyre for the girl to

express her sentiments. We find such changes of instruments according to the sense ably effected by Richard Wagner in the Rhine Gold. "Richard Wagner's works afford ample illustrations to show that sounds have to be used according to sense. Account for the exceptional array of extra instruments in the scores of the 'Nebulungen'; it is enough to say that they are used as a special means for special ends. Thus at the opening of the Rhine Gold the question is as to what sounds will best prepare for and accord with the dim twilight and waves of moving waters? The notes of the horns might be the musician's answer, but to produce the smooth wave-like motion upon the notes of a single chord, the usual two or four horns are not sufficient. Wagner takes eight and a beautiful effect is produced. Again in the next scene the waves change to clouds, from the misty mountain heights the gods behold Walhall in the morning sun. Here subdued solemn sound is required. How to get it? Use brass instruments piano. At the close of Rhine Gold, Donner with his thunder-hammer cleaves the air of mist and storm clouds, a rain-bow spans the valley of the Rhine and over the glistening bridge, the gods pass to Walhall. What additional sounds shall accompany the glimmer of the glitter of the scene? The silvery notes of the harps might do it, but the sounds of a single harp would appear trivial or would hardly be audible against the full chant of orchestra. Wagner takes six harps, writes a separate part for each and the desired effect is attained."

But we fear if these considerations are kept in view in the West in the big orchestras of today. For

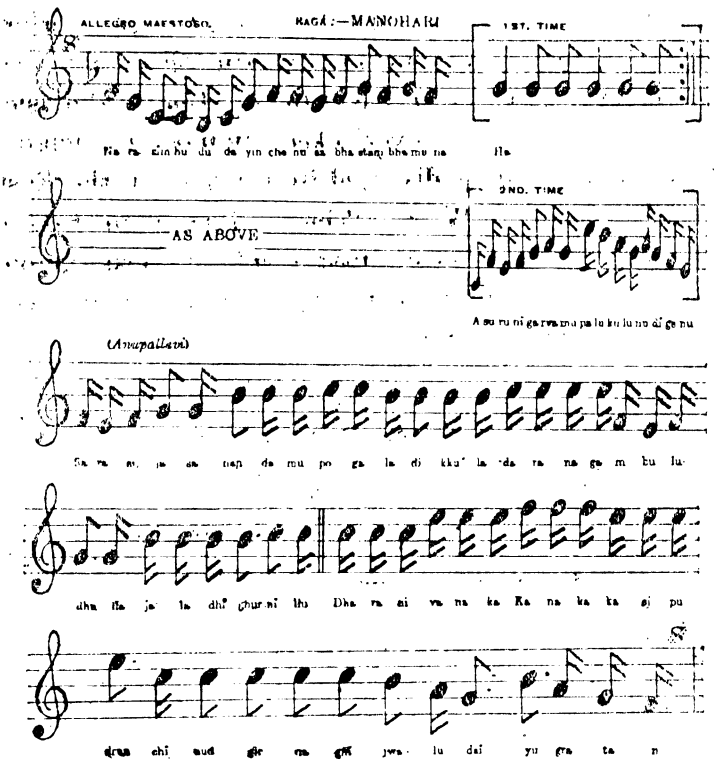
instance, in the Triennial Handel Festival celebrated in the Chrystal Palace, London, in June 1912, the choir and orchestra consisted of 4,000 performers under the able baton of Sir Frederick Cowen! Tremendous are the powers of discipline and organisation required of a person who has to command such a large body of musicians. We do admit that the Westerners possess these qualities in an eminent degree. But what is the emotion required to be expressed by means of so many instruments or does the music so produced express any particular emotion? Is it a mixture of the sublime and the beautiful? We have our own doubts if such a combination of sounds, however ingenious it may be, can pass for the natural and express specific emotions.

Narasimha (Man-Lion) is the fourth Avatar of God Vishnu. Owing to a boon earned by Rakshasa Hiranyakasipu, He was obliged to take a form consisting of a lion's head and a human trunk and tear the bowels of the demon to protect his beloved devotee (Prahlada). The words of the melody run thus—

God Narasimha issued out of the pillar supporting the hall. The pride and voice of the demon disappeared. The Universe split, its corners trembled, hills tumbled down, the ocean roared, the earth shook, when Hiranyakasipu was devoured 'with eyes flaming with anger.'

The scene depicted in the passage is an awe-inspiring one. To express such an emotion on the veena, violin, harp or lyre would be incongruous. We do not find any suitable instument in the Indian orchestra. The veena is too soft-toned and the human voice is also wanting in strength to approach the lion's voice perfectly. The 'Battle of Trafalgar' by Braham requires a change of instruments soft to sublime with the

Narasimhudu—Use A flat.



change of key after the first few bars. Thus do particular emotions require particular instruments. Heroism, awe and grandeur are expressed by the sublime notes of a piano; love, charity, and benevolence by the notes of a harp or lyre.

What strikes an Eastern ear as eccentric when hearing a Western orchestra of these days is, apart from the unnatural form of music, the motley of instruments used,—some beautiful and some sublime, introduced in an arithmetical rather than a psychological proportion. In Indian music, the question of timbre

does not enter into consideration in practical performances and every instrument excepting the percussive is intended mainly to enrich or imitate the vocal music. Full effect of timbre is overlooked by most musicians. Why? Psychology is divorced from music in the East as well as in the West. When a tender emotion is expressed by a powerful instrument, it looks heroic and vice versa. Timbre is therefore a factor which gives rise to contrary emotions.

The conception of the feelings of the Sublime and the Beautiful no doubt shows the high state of man's aesthetic culture. At the same time it testifies to the spirit of egoism which pervades his judgment of the rest of God's creation. Man holds that he is the image of God,—of perfection. His form is the most beautiful, his voice is the sweetest and his happiness is the only one to be cared for. So, in aesthetics, an object is recognized as beautiful if it satisfies his conditions and his taste. By itself, nothing is passable. The following is the translation of a stanza from Sanskrit:—

> In a wedding of camels, the ass was the bandmaster;
> The ass praised the couple for the beauty of their form
> And the camels extolled the ass for the sweetness of its music.

This passage is humourous; but it means more to an inquiring mind. Is not the camel beautiful? Does it not love its own form? Does it not caress its young ones? Would it consent to exchange its form for that of a man? We hope not. The braying of the donkey is harsh to man; subjectively, it is an expression of elation, of joy and frolic. Man thus artibutes his own values to natural sounds to suit his own convenience. This fact is very important in music. The song of the cuckoo given out when it is most jubilant is considered pathetic. The bleating of the goat is piteous. The cry of the kite is sorrowful. The notes of the lyre are said to be beautiful and so on. The art of music no less than poetry is considerably pampered by such selfish assumptions.

CHAPTER XIV

The Form of Indian Music.

Has the Art of Music a form fixed in Nature? Are its materials, shall we say, its parts pre-existing? It is not necessary to explain in full what *form* is; nor is it easy to do so. Form is the outward appearance of an object. It is its outline, its shape, generally the one designed by nature. Herbert Spencer rightly says,—"The various inflexions of voice which accompany feelings of different kinds and intensities are the germs out of which music is developed." But the greatest German scientist, Herman Von Helmholtz states thus:—"Music has hitherto withdrawn itself from scientific treatment more than any other art. Poetry, Painting, and Sculpture borrow at least the material for the delineation from the world of experience. They portray nature and man. Not only can their material be critically investigated in respect of its correctness and truth to nature, but scientific art-criticism, however much enthusiasts may have disputed its right to do so, has actually succeeded in making some progress in investigating the causes of that aesthetic pleasure, which it is the intention of these arts to excite. In music, on the other hand, it seems at first sight as if these were still in the right who reject all 'anatomization of pleasurable sensations'. This art, borrowing no part of its material from the experience of the senses, not attempting to describe and only exceptionally to imitate the outer world necessarily withdraws from

scientific considerations, the chief points of attack which other arts present and seems to be as incomprehensible and wonderful as it is certainly powerful in its effects." Helmholtz's remarks constitute a dangerous perversion of truth. Another European scholar says, "When music goes with words emotions are attended with definite ideas, but the same ideas would be conveyed to the mind equally well by the same words if they were simply spoken. What suggests to the one the vicissitudes of war will suggest love to another. The infinite variety of ideas which may thus be called up in different minds by the same strain of music is proof enough that music is not like any particular thing." Yet another critic observes:— "Who can doubt after hearing but the first chord of Beethoven's Sonata Pathetique that the matter in hand is profoundly serious? and the same composer needs no more than one measure to inform his listeners that the sonata of 31, no. 3 in E flat is in accord with the feelings of cheerfulness, and a mood of sunshine? Yet everything so instantly obvious to one will mean almost the reverse to another. The Fugue in D major from the first part of the well-tempered clavi-chord by Bach, has been called by one the most deeply religious fugue in the volume while another replies that the fugue is the baffoon of the collection full of rollicking humour." How we wish that these critics had studied the property of the mind called "apperception" before they attributed to music such wild and fantastic interpretations!

"Fine arts" is the name given to a whole group of human activities which include architecture, sculp-

ture, painting, music and poetry. These minister not to the material necessities of man but to his love of beauty. "Architecture is both a mechanical as well as a fine art, for it affords shelter to man and impresses upon him a sense of the beautiful. Fine arts are divided into the imitative and the non-imitative. Even architecture is considered as an imitative art. The aisles of Gothic churches were partly designed to evoke the idea of the aisles of a forest. In the temple-palaces of Egypt, one of the architectural members, the sustaining pier, is often symmetrically wrought in the actual likeness of a lotus. In Greek architecture columns are shaped in the human form but when architecture imitates nature it becomes sculpture."

"In an aesthetic effect a distinction must be made between the immediate element acting directly and the associations excited. In music the direct factor prevails and in poetry the association; the plastic and pictorial arts stand in this respect between the two. The feelings excited by sound and rhythm, by the rise and fall, the strife and harmony of sounds have a vague and general character and do not necessarily arouse definite ideas. The strong influence of music on feeling depends upon the very freedom and depth of mood which result from the fact that the whole audible expression of feeling is called without the definite occasion or object which in every individual case excites it. This is why musical compositions admit of different interpretations; to one and the same direct element very many and varied associations may correspond." Music, it is true, admits of many interpretations; but they are never contradictory. Every art has its own limi-

ted sphere of expression. No poetry can fully bring the figure of Satan to the mind. A statue of an equestrian may be that of Clive or Napoleon. But no sane person will mistake it for that of Queen Elizabeth or Joan of Arc. 'A painter cannot produce a picture of the law of gravity; the sculptor cannot express in clay the fact that two parts of hydrogen and one of oxygen combine together to make water. Likewise, the poet cannot write a drama on the subject of twice two is four;' The painter and the sculptor express what is seen and musician what is heard; both the expressions may admit of many interpretations on account of their general character. Music is as precise as mathematics, one deals with sensations and the other with figures. Two and two make four is a mathematical fact; but the numbers two and two may denote apples, rupees, or horses. A series of tones arranged in a particular order mean only one psychological fact; a feeling and no other, provided the listener has a warm heart and a clear head. While the science of mathematics is built upon elements whose significance is known to every one, few musicians could be found who are acquainted with the feelings of the very A, B, C of music. Mrs. Cousins, Bachelor of Music of an English University is not aware of the meaning of Do! and yet she talks of the Higher Psychology of Music! Why wonder if music does not yield to scientific treatment in these circumstances. How can any one who knows not $1+1=2$ interpret $(a+b)^2=a^2+2ab+b^2$ or the puzzle $\sin^2 A+\cos^2 A=1$? Therefore every critic of music who is without any knowledge of the psychological values of the musical notes must necessarily come to

grief if he should try to decipher the emotional significance of passages.

An infant cries in the cradle; its mother hurries up to it and suckles it. The cry does not cease. She fears that there is something pricking in the bed and so she changes it to a soft and warm one; still the cry continues. Now the good lady suspects some physical ailment, when a doctor is called in and the baby is relieved of its stomach-ache by a dose of castor oil. More than one interpretation is possible to put on the cry of the baby, but they are of the same kind. To mistake the cry for the cooings of a happy and cheerful mood and to allow the child to itself would only argue an aberration of mind as that betrayed by the artist who would detect 'rollicking humour' in the piece of Bach which is considered as the most pathetic. All musical expressions without words are like algebraical formulas to which only a few particular values could be given. We may sometimes have indeterminate equations in music like $x-y=1$.

Indefiniteness of meaning is not peculiar to the tone-language. We have it even in the word-language. When we say "There is no rose but has a thorn" very many interpretations are possible. Romeo finds many a Tybalt between Juliet and himself, while Shylock may mean that every coin has some trouble attending the earning of it. James Sully:—"It must be remembered that language is in its nature general and abstract. Words (other than proper names at least) tend to call up not a definite image of one particular object but a typical or general idea of a class. Hence all

verbal description of individual scenes, persons and so forth has to proceed by a gradual process of qualification or individualisation. That is to say, the general name has to be supplemented by a number of qualifying terms each of which helps to mark off the individual thing better. Thus the historian depicts a particular king or statesman by progressively enumerating his several physical and mental qualities. Now each of these, like the general name which it qualifies, is in itself nothing but an abstraction. Then the terms "strong," "wise" and so on applied to a person are themselves general terms each applicable to a number of persons. It follows that the process of realising the description turns on the proper combinations of these several general ideas into the image of a concrete object. The following of a scientific description of a new animal or plant with its highly technical terminology illustrates the difficulties of the process of "concreting the abstract" in a yet more mechanical manner. And a still greater strain is imposed by the description of the "extra-sensible" world of atoms and molecules with their intricate interaction. To visualize or see with the external eye what is thus described implies a considerable reaction of the imaginative power." How much more varied should be imaginative power when one has to visualise a feeling expressed by means of musical tones!

We affirm that music like all other Fine Arts and much better than poetry imitates nature. Examples are not wanting even in the works of European artists. It imitates the natural phenomena either in form or by

suggestion. "In all representations the things represented may be symbolic in meaning but they may be set in a land of dreams and grouped in relation and in circumstances upon which the sun never shone, but it is from real things and persons that the lineaments and characters have been taken in the first instances in order to be attributed by the imagination to another and more exalted circumtances." Does not instrumental music imitate the sounds of nature as the piping of birds, the moaning of storms, whispering of forests and explosion of thunder? We have the notes of the dove in Haydn's Creation and of the cuckoo in Beethoven's Pastorals symphony, the bleating of the sheep in Don Quixote of Richard Straus.

The works of Richard Wagner are quite sufficient to prove that music is an imitative art. "Let us consider the tetralogy or the Ring of the Nibulung. In the Ring the opening bars represent water—an E flat chord sustained and wondrous denotes the repose of nature; slowly harmonics, notes, rhythms, later, other instruments are added till the air pulses to the sound of moving water, then a torrent, a wave, a great flooding river and a curtain rises to disclose the Rhine depths and the maidens. It is little short of weird the way in which Wagner's music makes living even inanimate things and gives voice to them. The few notes, for instance, that describe the glittering and desirable gold; the Ring itself; the golden apples with which Freia supplies eternal youth to the Gods; the spell of the Flames that guard the slumber of Brunnhilde; the Forge whereon Seigfried's invincible sword is wrought; the Shimmering Rain-bow, the Sword of the Gods.

The power to express action was another quality in the genius of Wagner. Take as instance the fish-like swirling movements of the Rhine-maidens; the flight of Freia, the Tempest, Hunding's pursuit of Siegmund and Siglinde, but above all the wonderful Ride of Valkyries."

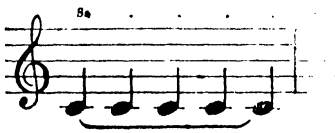
Music is an imitative art, it borrows its material directly from Nature. The sculptor sees a statue in every stone; likewise, the musician hears his art in every sound—the song of the bird, the babble of the brook, the soughing of the wind and the melody that bursts unbidden from the untrained lips of the maiden are full of material for him. Nature supplies him with cloths of various kinds. The musician has to cut them to cover the bodies of living men and not those of unnatural beings—elves, imps or devils.

Life starts in the womb. The only sounds then affecting the foetus are those that constitute the murmur of circulation of blood going on in the mother's body. But the ear begins to perform its function the moment it is born into the world. It hears its own cry. As it grows from days to weeks, from weeks to months and from months to years, impressions on all sides enter the brain and are retained in it. Will he or nill he, from every sense organ,—eyes, ears, nose, skin and the tongue, pictures of various impressions fall upon the brain and leave an indelible mark on it. The child takes delight in seeing coloured and moving objects. It is also pleased with sweet sounds and scents. By degrees it gains more and more knowledge about the objects with which it daily comes into contact. Its

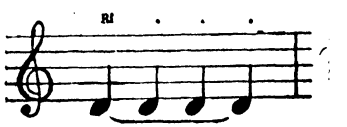
memory now comes into play and it can make out contrasts between percepts and images. The brain acts as a store-house of these impressions of external objects. Pictures of animals and plants together with their properties are treasured up in the mind. Objects like the rose, the peacock, the parrot and the sky furnish it with examples of colour. Dogs, crows, elephants, mountains and such like objects represent various sizes. Milk, fruits and other eatables develop his sense of taste. Likewise, sounds proceeding from all animate and inanimate objects attract its attention. The very first sound affecting the brain is the painful cry of the new-born babe. Then come the sounds of pet animals and birds such as the dog, the cat, the bee the cow, the sheep, the crow, the sparrow, the cock, the dove, the donkey, the horse and other innumerable living beings that surround him. Their sounds are heard separately or simultaneously. The rattle of the wheel, the whistle of the engine, the murmur of the brook, the peal of the thunder—all these sounds find a place in the recesses of its brain with the associations of their origin and significance. The material of knowledge in sound is derived also from such sources as:—To sing like a lark, to hum like a bee, to roar like an elephant or a lion, to grunt like a pig, to murmur like a river, to ring like a bell, to tick like a clock, to splash like water, to chirp like a sparrow, to hiss like a serpent, to mew like a cat, to warble like a bird, to coo like a dove, to laugh like a hyaena, to reverberate like thunder, to grumble like a widow, to bray like an ass, to cry like a child or woman, to howl like a wolf, to bark like a dog, to caw like a crow, to bellow like a

bull, to whiz like a cricket, to crow like a cock, to pur like a cat, to bleat like a goat, to weep like a woman, to hum or buz like a bee, to snarl like a dog, to giggle like water, to neigh like a horse, to shimmer like water, to prattle like a child, to sigh or sob like a woman, Bang went the door! a rustling noise, a dull thud, hush, Humph! Ah! O! Ding, dong, bell!! It is from such material so profuse in nature that the art of music draws its nourishment. From these flowers, the honey of sweet music is gathered. Sounds such as braying or barking are not introduced into the art bodily. Their timbre and form do contribute to music either as positive elements which should be present or negative ones which are to be avoided.

Whenever a person is excited under emotion, be it painful or pleasurable, a continuous sound is emitted to begin with as below,—



In expressing severe pain or even pleasure, a person emits sounds of uniform pitch, which act as valves to let out the feeling. If the feeling is more intense, the pitch will rise higher, thus—



A dog before angrily barking at an enemy begins to growl in a uniform pitch. Certain birds produce a uniform note before breaking into song. The cuckoo when

pursued by a crow or a mate emits a series of broken sounds of uniform pitch, like a squirrel.

When one of the moods explained in Chapter XI affects the mind the voice moves up and down through certain stages in the stream of consciousness and gives rise in art to what is called a Raga. When the mood grows in intensity the voice moves in various curves, turns, twists and ascents and descents of various kinds. The fundamental mood of the healthy vital feeling gives rise to Raga Dhira Sankarabharana. In the flow of the emotion the voice simply goes up and down as may be seen when a child is crying, a cock crowing, or a dog barking or a cur hit by a stone; but an artist while singing a song, brings all his genius to bear on the subject and throws into prominence all the features of the emotion by varying the timbre, time, grace and form. He uses plain as well as figures of speech, more especially metaphors.

"When we cannot represent directly a psychological phenomena, a feeling or an abstract idea, we employ a symbol, an image, of which the exactness depends not on the resemblance between the sign and the thing signified, but on the association of ideas which intervene and serve as a link between the two terms. This is a process continually used in ordinary language. We lend to ideas a weight, we talk of heavy or light ideas; or a colour or a flavour as sweet or inspired thoughts. It is in the artistic language of poetry that these images multiply and develop."
"Weber, after having contemplated a landscape near the cascade of Geroldsan, writes a passage of his Der

Freischutz. Goethe, on the contrary after listening to a piece of Bach's said—"How grandiose and full of pomp is this? It brings before me the vision of a procession of great personages in gala-dress descending the steps of a great staircase." The first has the musical imagination which purifies and spiritualizes the reality; the second the plastic imagination which materializes abstraction."

"Even without words we have in the works of Schunnan and Chopin full stories related in the unaided language of music. Chopin based them upon poems which are extant. In the Third Ballad in A flat op. 47 he has composed in music a story which is embodied in verse by Michierwicz. The story tells us of a nymph who fascinated and charmed a young prince but who always vanished from his sight in mist when he urged her to become his bride. At last, however, she promised that if he would be faithful to her only one month without seeing her, she would give her consent. Of course he swore eternal fidelity. But the month had hardly begun when she appeared to him in a new and uncognizable disguise more bewitching than before. His vows were soon forgotten and his protestations to his supposed new sylph grew warmer than ever to the deserted one. But just as he was convinced that he is about to win this charmer, she reveals herself to him as she had formerly appeared and with much laughter at his confusion and chagrin, she leaves him for ever exulting in her escape."

Such metaphorical and figurative expressions extend to simple phrases and sentences as they do to

whole narratives. So we find musical notes, ascend or descend, rise or fall, break the course, jump, dally, waver, prolong, tremble, dash, slide, creep, strut, wander, shoot and circle. In other places, they rise and flow like rivers, or proceed in wavy motions like mountain ranges.

It is very interesting to note that several beautiful impressions, created on the mind by ocular phenomena, are transferred, by association of ideas, to the auditory field, and give rise to very agreeable sensations. An arrow or a meteor shoots through the air, and when a musical sound imitates its motion and proceeds with rapidity from one note to another, it gives rise to a beautiful feeling. Geometrical curves of different shapes please the mind, and so do the musical notes which constitute curves of different forms, or which rise and fall in progression.

S a a a represents a straight line ——————

SR, SR, SR 

A slur represents

A tremor

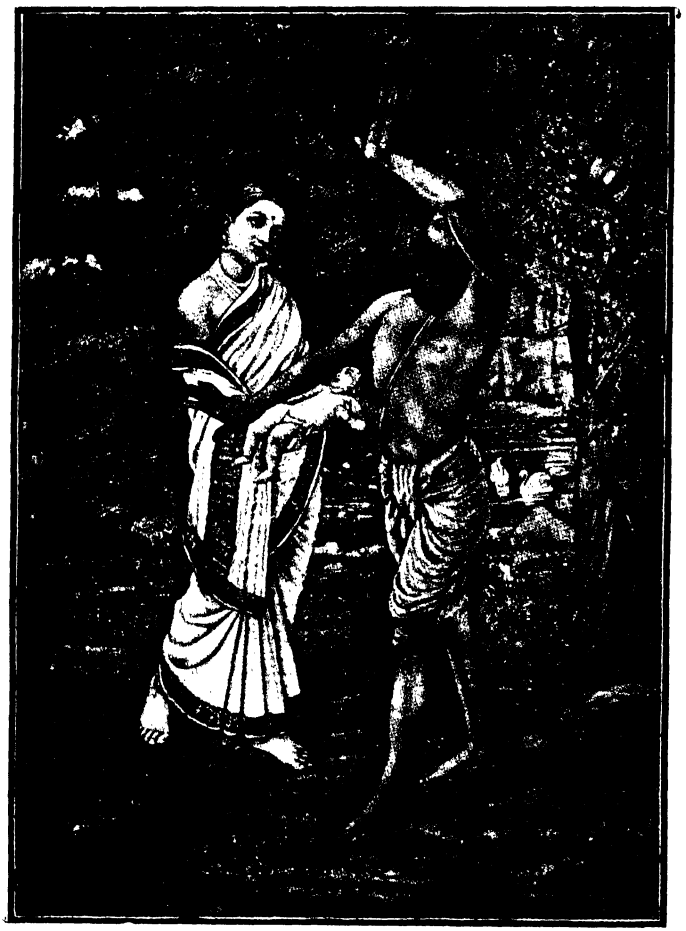
Staccatos — — — — — —

In this way, the flow of emotion traces beautiful geometrical figures and the charms of music are greatly enhanced by a knowledge of such forms of movement. We have all watched, while we were boys at least, the beautiful motion of kites in the air. In the gust of wind they rise suddenly, flutter for a while, and fall to the ground. A vulture soars to the sky, hangs quite motionless for a time in search of its prey, and pounces upon it. A tame dove goes up into the sky, in ever-

widening circles, and descends similarly with one or two somersaults in each circle. A combination of certain notes represents a simple circular motion. Another combination represents single somersaults, while a third represents double somersaults. Singers are therefore in the habit of moving their hands in various ways only to represent the nature of the motion of the sound. In cases of exaggeration, some move their hands as if they have to grind corn, others as if they have to pound rice, while not a small number shake their limbs as if they are seized with convulsive fits. A clever musician, (so goes the tradition) once went on a professional tour, and during his long travels he had to halt for a night in a small village, where the rustics had never tasted the sweets of the art of music. A number of them collected round the musician, who began his performance by singing a few beautiful songs. Nothing attracted the simple folk so much as the trembling of his hand and the shaking of his head. Their attention became more and more concentrated, and the musician spared no pains to display to them his best talent. Having never seen a physical feat of that kind, the audience came to the conclusion that the performer was really seized with a severe convulsive fit, as their cattle and sheep were sometimes wont to have, and soon devising a very simple but effective means of cure, they procured two red-hot irons, branded him in a few prominent parts of the body, and thus restored him to his equilibrium. We are not told, however, whether the musician continued his tours from that time.

In singing or playing any Raga on an instrument

The Discord of Life.



Menaka,— "Please, Sir, here is your little daughter."
Sakuntala,— "Hi—hi—hi—hiiii....."
Visvamitra,— "Ugh! What a shame! God bless me."
Menaka's face represents Ga, Sakuntala's Ri and Visvamitra's M 2 or F sharp.

the melody stops at each stage of the mind and with it as the central point, weaves a web around it with threads running in circles as well as straight lines. We shall now illustrate, by reference to a picture, the meaning of the musical notes and the ragas. Viswamitra, in the figure before us, was a great rishi (saint) of extraordinary intellectual and spiritual powers. By force of his penance he could command the elements of nature, and once he created a heaven (Swarga) of his own in defiance of the power of the Devas. While he was absorbed in deep meditation in his hermitage, the angels grew jealous of him, and in order to obstruct his meditation they engaged the heavenly nymph, Menaka, to entice him away from his meditation into the enjoyment of carnal pleasures. Accordingly, she started on her mission to the hermitage of the Rishi and captivated his heart by the charms of her beauty. Poor Viswamitra! He yielded to temptation and the offspring of their love was the baby, Sakuntala. Some months after the birth of the child, Menaka carried it to the hermitage and presented it to its father. Was Viswamitra its father? What a shame for a rishi to acknowledge the fact! Stricken with conscience he hides his face.

Let us see what raga would suit the couple if each were to give vent to the feelings through music, without any words accompanying. Menaka is not certainly in a sorrowful mood. She is conscious of her former triumph. She is only respectful and enquiring. R_1, G_1, M_2 are not appropriate. So the notes must be S, R_2, G_2, M_1, P, D_2, N_2 S which gives us Shankarabharana or Bilaval. She is not in an excited condition as he is.

Her raga contains all the seven notes, and the movements must be calm and dignified with many *andolitams*. The *Raga alapa* or music would run as described below if it could be translated into the word-language. Menaka holds the baby in her hand, and addresses Visvamitra.

NOTES:—S a a a a a a a a a a (tranquillity)
I am Menaka.
G R S a a a a a a a a a a a
I am your Menaka.
M G R S a a a a a a a a a a
I am your beloved Menaka.
M G M P D N S a a a a a a a a a a a (Perception)
Look at me; surely, I am your love.
S N D P M G R S a a a a a a a a a
I, your love, have come to you again.
R i i i i i i i i
This is your baby, is it not? (enquiry)
P M G M G R i i i i i i i
Do you see how beautiful it is?
G M D P M G R i i i i i i i
How nice are its limbs?
G a a a a a a a a a a a
Imagine how matters stand now.
G M P D P M G a a a a a a a a a a
Is it proper that you should thus neglect us?
M a a a a a a a a a (Egoism)
I am the heavenly nymph,
G M P D P M a a a a a a a
I live with angels divine.
S N D P M a a a a a a a a a a
Believe me. I am angelic in my form.

The above music as well as its translation represent the bare skeleton of raga-alapana, which may continue for hours together. The nature of the arguments

need not be actually as represented here, but similar in expressing pathos, entreaties, appeals, threats and persuasions. When, with the help of the graces, skilful variations are introduced, the singing of Menaka becomes more eloquent and forcible than the oration of any great orator in the world. Under the able exposition of an eminent artist simple combinations may develop into soft appeals, mild entreaties, emotional outbursts, torrents, and climaxes, with all the grandeur of expression that we meet in the prose works of Macaulay and other great writers. Figures of speech much criticised in the word-language, such as Tautology, Circumlocution and Redundancy are highly appreciated in music and very largely used in Indian music. Under strong feeling the mind dwells upon an object and is not tired of repeating it under various names. Even the same word may be repeated. Sometimes, the same thought, is iterated in different terms as below.

'Slowly, slowly, the days succeed each other.
Days and weeks and months.' (Longfellow).

Emotion in music expands by tautology. The more it is dwelt upon, the more it swells like spring water. To a Western ear, it strikes as monotony which tautology is. When true feeling excites the mind, repetition is itself an ornament. A mother does not find sufficient expressions to describe her child. A lover feels his vocabulary too poor to address his mistress,— my dear, my darling, my sweet, my rose, my dove, my love, etc. Whether the terms convey any sense or not, repetitions to him are sweet and afford pleasure. So does a Hindu devotee coin names in hundreds (12, 24, 108, 1000 as in Dwadasa, Chatur-

vimsati, Astothara and Sahasra) to dwell with piety upon the idea of God. To tell the beads, to smother one with kisses, to feast one's eyes upon, involve tautological ideas. Emotion empties itself only by repeated puffs and repetition is most resorted to in music. In some songs one and the same passage is sung in different variations. Compare Yaduta, chapter XI and Chakkaniraja, chapter XVII, with their variations. Every variation is an improvement upon the other and discloses new phases and alters the character or tone of the foregoing one. After these variations are over, the mind is freed from all disturbances. It becomes calm and attains a peaceful state.

"No work of art, (as Steadman observes,) is worth considering unless it is more or less effective through beauty, feeling and imagination and in the consideration of art truth and ethics are a part of beauty's fidelity to supreme ideals. Truth and beauty are equivalent terms. Beauty is the unveiled shining of truth; But a given truth to be beautiful must be complete. Truth which is half-a-lie is intolerable. Imagination is the creative origin of what is fine, not in art and song alone, but also in all forms of action—in campaigns, civil triumphs and material conquests. Poet's imagination—it bodies forth the forms of things unknown and through the poet's pen, turns them to shapes and gives to airy nothing a local habitation and a name." Again "the poetry of a poet is feeling itself using thought as a means of expression." In good music, as in good poetry, all these requisites are present. Indian music is essentially an imitation of Nature.

CHAPTER XVI

The Form of Western Music.

We begin in this chapter a very controversial but interesting subject; namely, the form of Western Music. There are many books dealing with the subject. The 'The Evolution of Musical Form' by Miss Margaret Glyn is by far the best. It is an admirable work in which the authoress exhibits a lucid grasp of her theme and she tells it in a clear and forcible language, but we regret to observe that she has treated the art only as found at present in London concert halls and not as it exists on the world-stage. She has also ignored the fact that music is a universal and natural language which expresses such different and specific emotions as joy, sorrow and anger and in her exposition, she has disregarded the abundant material that lies broadcast everywhere in Nature. What the defect was in the primitive music as regards its capacity to express the emotions and how the development of Harmony and Counterpoint improved the art, she, like other musicians has not troubled herself to discuss. It is all well to trace the evolution of man from the ape as Darwin has so ably done; but is it not necessary to point out how man is superior to it in attainments? To establish the theory of consonant intervals, Miss Glyn bids us repair to a forest and intelligently listen to the blackbird's song in the spring. It is in surgery that in view of the assumed preciousness of human life we begin with frogs, rabbits and dogs for

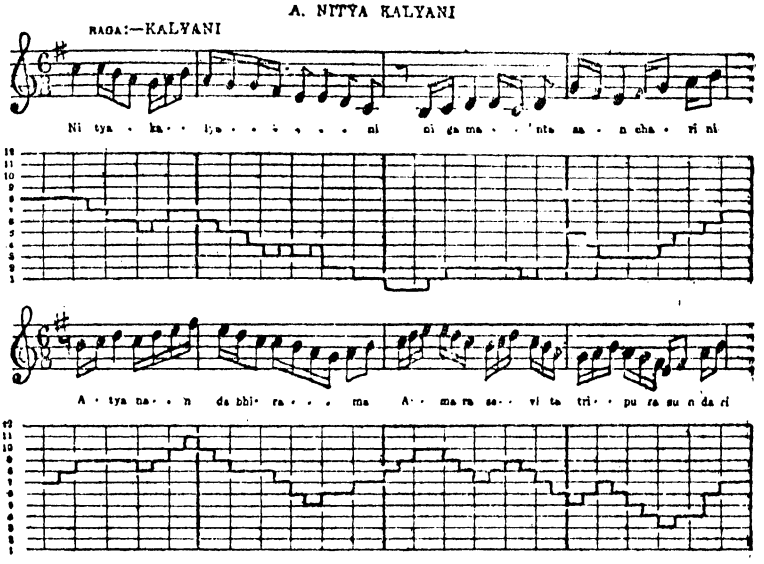
our experiments. Why follow the same course in the innocent art of music? Why should we go to the forest when we can gather here and at this very moment the best material for music,—from the voice within our own breast? In her discussion it is to be regretted the materials are far-fetched and the subject of emotion has been altogether neglected. The art is treated as a body without the soul; the consequence is disastrous.

Western music is built upon three artificial premises. Firstly:— 'Consonance by which the musician means the relations of tones that satisfy the ear points to the third as the fundamental interval.' Consonance has a root in Nature as well as man. Wherever we turn our ears in Nature we find the presence of consonance as well as dissonance. Hear the cry of the newborn babe. The interval varies with the degree of discomfort. The day begins with the dissonant crow of the cock. In sorrow the voice moves mostly by chromatic intervals. In joy it skips according to the strength of the emotion. Consonance, it is true, has a root in Nature. We have ourselves pointed out in page 82 that the mood of Nature is a gladsome mood and all other moods are its modifications. Emotion with which music has to deal is but a mental aberration from which the mind seeks to recover its equilibrium and in which dissonance plays a more important part than consonance. It is the artificiality of the first premise that has made the Western music uncouth in form like the camel or the kangaroo as well as ungraceful in movement.

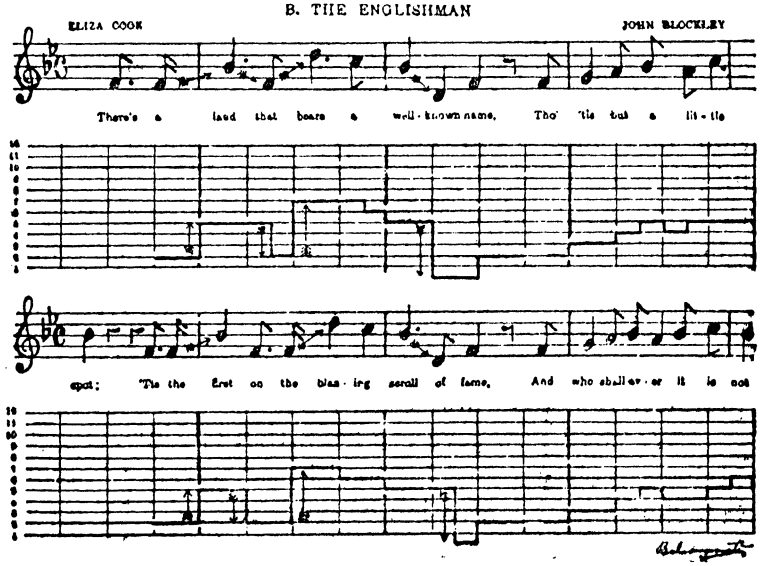
Where in Nature, vide page 117, do we hear any sound running in such a form as shown in piece B in

Music in Graph.

A. NITYA KALYANI



B. THE ENGLISHMAN



The voice turns right about at every step, shoots to the top and plunges down to the bottom. Even noise from which the best examples of musical facts could be gleaned does not show such angularities. Examine any motion in the universe and draw its picture. You will find that in all activities of matter, animate or inanimate, of energies like heat, light or electricity, a gradual transition as seen in the curve of Indian music (Piece A) is the order. What in Nature is an exception and a rarity passes as the rule in Western music.

Secondly:—It is stated that "Discords are wanted in music for the purpose of relieving the monotony of perpetual concords." Again, "A certain proportion of discords is necessary in consonant music but in other respects the use of discords is purely an aesthetic character." No maxim ever perpetuated an untruth in art as the above. "The effect of concord is pleasure and that of discord pain." Is it not reasonable to use concords to express pleasure and discords for expressing the feelings of pain? Pleasure is enhanced by variation and suspension but not by contradiction. One might as well fall ill purposely now and then to relieve the monotony of health! The idea is good only in conception but not in execution. The second premise has destroyed all difference between painful and pleasurable elements of expression in music. The twe premises operated together and gave rise to the third premise, viz. that 'music is not an imitative art.'

We shall now give the definition of Harmony and Melody as they are understood in the West. "Melody is a rhythmical succession of tones ranged for the most part within a given key and so related together as to

form a musical whole having the unity of what is called a musical thought at once pleasing to the ear and characteristic in expression. While melody consists of a succession of single tones, Harmony is a consonance or agreement of tones as also succession of consonant musical combinations or chords. A chord is itself a combination of tones simultaneously performed producing more or less harmony." Melody according to Indian conception consists of Ragas which are combinations of particular notes running successively in the octave so made as to express a particular emotion. Harmony as understood in the West does not at all exist in Indian music. Vague, indefinite and even inaccurate are the opinions held by Western musicians themselves as to the merits of Harmony. M. Rousseau seems to be of opinion that music is not really improved by Harmony. Dr. Burney and Tartini state that "Harmony is the better of the two systems. Many pieces of music in parts even by the greatest masters which are universally admired would sound quite insipid if divested of that Harmony which animates them." Again, "All these instruments (Piano, Organ, etc, being far inferior to the voice, the spontaneous gift of Nature, in promptitude and in the power of obeying every call of sentiment, every degree and every call of emotion with which the heart was agitated, singing in parts was never contemplated by Nature." All the authorities quoted above speak as if Harmony were an artifical sport or pastime similar to Polo, Cricket or Chess. Their opinions are full of contradictions. Who can decide when doctors disagree? Is it not Nature? Melody in Nature is a succession of tones proceeding

from a single individual so as to express a definite feeling; but the song of the cuckoo and the warbling of the rivers may also be termed as melodies. Harmony is the agreement of different melodies when more persons than one sing or play. When in art several instruments such as the violin, piano, sarangi are used to enrich a melody and reinforce its pitch or rhythm the music still retains its character of melody. The instruments are in unison or at the interval of an octave. The movement is a continuous flow of sounds at once pleasing to the ear and conveying a definite emotion. When two or more persons simultaneously sing or play different melodies what is called Harmony is produced. The notes of the two melodies should always run in particular relations of pitch so as to form concords or discords. In duets, trios and quartets more persons than one take part in singing, each of them expressing his own feeling; or a number of instruments may be employed and played together to express a combined feeling. Melodies constitute the warp and woof of the texture of Harmony which term applies to the combined effect. A fine example of Harmony of sounds in Nature is described by Goldsmith,—

"Sweet was the sound, when oft, at evening's close,
Up yonder hill the village murmur rose.
There, as I passed with careless steps and slow,
The mingled notes came softened from below;
The swain responsive as the milkmaid sang,
The sober herd that lowed to meet their young,
The noisy geese that gabbled over the pool,
The playful children just let from school,
The watch dog's voice that bayed the whispering wind,
The loud laugh that spoke the vacant mind.'

These all in sweet confusion sought the shade,
And filled each pause the nightingale had made."

A sweet 'confusion of sounds' in Nature becomes beautiful Harmony in music.

The Music of the Spheres is Harmony by metaphor.

Look how the floor of Heaven
Is thick in-laid with patines of bright gold ;
There is not the smallest orb which thou behold'st ;
But in his motion like an angel sings ;
Still quiring to the young-eyed cherubins ;
Such Harmony is in immortal souls ; (Shakespeare)

Each star or planet retains its individuality and is yet bound to the central luminary, the sun, by the law of attraction.

The following is Harmony by analogy,—

I'll twine white violets, and the myrtle green ;
Narcissus will I twine, and lilies sheen ;
I'll twine sweet crocus, and hyacinth blue ;
And last I'll twine the rose, love's token true ;
That all may form a wreath of beauty, meet
To deck my Heliodora's tresses sweet.
Goldwin Smith's translation of the Greek poet Meleager (1st century B.C.)

In spite of such clear examples of Melody and Harmony in Nature, greatest misconception exists in the West as to their nature. One critic thinks that Harmony is simply embellished melody. Another writer affirms that singing in parts was not intended by Nature! These misconceptions have resulted from the presumption that music is no imitative art. "Artistic imagination" says Hoffding, "in its simplest form is imitation of reality, and in a certain sense it never goes beyond this. To grasp and reproduce the real in all its individual fulness is a problem which can be solved only when the imitative and imaginative

powers have reached their highest development. This is the realistic element in all art, appearing now as a sober, scrutinizing penetration, now as a sympathetic absorption in the material given; without this impulse art would beat the air."

In modern Harmony, the element of truth is wanting. When Helmholtz proclaims that music does not borrow from our experiences, where is truth? and where is the ideal? They grope in darkness though under the impulse of instinct they find half-truths. But, "Truth which is half-a-lie is intolerable." We see emotion in Western music as we 'see faces in the fire' or as the various figures at the edges of clouds—human forms, lions, unicorns, elephants and so fourth—constantly transforming their shapes, one into another. Under such conditions it is no wonder if the modern student of Western music should find himself in a fix and exclaim like M. Camberieu,—

> "What a strange history of music! Everywhere, in all ages, one sees in it something mysterious and inexplicable which places it outside the other forms of human activity. At the present time even when we call to our aid all the resources of our "Sciences" we are unable to explain clearly what is it that moves us when we listen to a beautiful air of eight bars and the modern mind, though freed from many superstitions is often obliged to speak the same language as that of primitive folk.',

Music is certainly great a mystery in the West as it is in the East and the artist is himself responsible for making it what it is. Hanchet says that 'It is impertinent to ask the meaning of melody as it would be in the case of a traveller who on seeing a marble statue asks what its price would be.' Why should you not ask the price of the statue if, after admiring it as a work of art, you wish to have one in your studio? Again he

states,—"At times the composer translates into musical metaphors feelings or objects known to both himself and his hearers. At other times, he translates feelings known himself alone and which he does not think it expedient to indicate to us exactly. Thus Haydn it is said, when writing a symphony not seldom wrote a synopsis for his own use. At other times, again he translates feelings of which neither he nor his audience have any clear notion because they are hardly concious of them." How any one can translate feelings of which he himself is not conscious is another mystery. Every piece of music and every symphony of Beethoven or Wagner must yield to analysis whether the composer wishes or not and is conscious or not. The West is in a chaos in point of musical interpretation though as they may state 'Harmony belongs exclusively to the civilized nations of Europe'!

In his preface to captain Day's book on South Indian music, Mr. Hipkins says "The greater freedom in musical intervals that melodic system allows must be reckoned as compensatory in some measure for want of those harmonic combinations of which our European music has such inexhaustible wealth. What we lose in the possession of this rich estate is that we are effectually barred form the use and enjoyment of a more pliant melody free from the fetters imposed by consonant chords, a melody which has a great privilege in easily touching the emotions."

It will be long before the opinion is banished from the musical world that Harmony and Melody are two different systems of music one compensating for the other. It is useless to talk of a perfect system of

Harmony without a perfect system of Melody while the reverse is possible. Melody as once stated is a part and Harmony the whole. Without perfection in the part the whole cannot be perfect. A mixture to be wholesome must have all its ingredients in a thoroughly finished and purified state.

Melody in Indian music has reached a stage beyond which it is not possible to proceed. The division of melodies according to Root-Ragas and their derivatives, the subtle emotions that they express in a degree which no psychologist has ever dreamt of, the artistic beauty created by the perfect use of grace, timbre and rhythm as expressed by means of the drum and above all the most faithful imitation of Nature constituting the realistic and the most essential element in art make Indian music the glory of India and the pride of its inhabitants. To an earnest student of comparative systems of music it cannot but be a matter of the keenest regret that the European should, being unable to appreciate its beauty, have stood outside the Paradise of Indian music. It is also regrettable though in a lesser degree, that the Indian should be a stranger to the principles of Harmony, whose grandeur, has not been psychologically valued by the Westerners themselves. Harmony is of a wider sphere. It extends from pole to pole. If properly wielded, it can express such tremendous feelings very graphically,——

> Earth trembled from her entrails, as again
> In pangs, and Nature gave a second groan
> Sky lowered, and, muttering thunder, some sad drops
> Wept at completing of the mortal sin original. (Milton)

It is not at all in the power of melody to express such grand emotions. Indian composers including even the

celebrated composer, Tyagaraja, have not attempted to express such emotions. Only once did Sadasiva Rao of the Mysore palace give vent to the feeling of the Sublime in Narasimhudu, Vide page 106, in which the imitation of sound and sense is very well expressed by the composer as we find in Tennyson's poetical works. The Raga is Manohari in which the two long intervals from S to G and D to N invest the mood with a tinge of fierceness. Notwithstanding a few other devices calculated to give a realistic appearance to the emotion it falls very short of the grand effect that would have resulted if Wagner or Beethoven had handled the subject and expressed it by means of suitable instruments played simultaneously. We have in The Tempest:—

> .....I have bedimmed
> The noontide sun, called forth the mutinous winds;
> And' twixt the green sea and azured vault
> Set roaring war; to the dread-rattling thunder
> Have I given fire and rifted stout Jove's oak
> With his own bolt; the strong-based promontory
> Have I made shake and by the spurs plucked up
> The pine and cedar; graves at my command
> Have waked their sleepers, oped and let them forth
> By my so potent art.

What Prospero achieved by means of the Black Art of Magic, the Fine Art of Music can accomplish through only the Western system of Harmony.

The rules of Harmony as conceived by Rameau, of agreement of sounds as concords and discords, and the device of transposition of scales argue such a high degree of enlightenment in music that is worthy of the Western culture. But the means is mistaken for the end and the sound for the feeling, while the pernicious assumption that music is no imitative art is eating up the very vitals of the Western system like a cancer.

Both the Indian and the European have started with a clear ignorance of the emotional values of the musical notes. The Indian perfected his melody instinctively and stopped there, while the European disregarded the melodic system, clean jumped over it, and cultivated the system of Harmony which in spite of the operation of wrong premises is still the most wonderful. While the Indian system remained fully true to Art and Nature the European system oscillates between the real and the imaginary. While it is a luxury for the Indian to become acquainted with Harmony, it is a sheer necessity for the European to cultivate the rules of Melody.

Right musical education in all the countries ought therefore to begin with Melody as used in India. After it is perfected, the principles of Harmony should be practised. Indian Melody unaltered in form should when possible and necessary be fitted bodily into Harmony and it is only then that we have a perfect system of music at once pleasing to the ear and aesthetic in form and sense, approaching the music of Nature. The suggestion may seem chimerical, but it is the natural and the ideal. At least, it is far better to leave the systems as they are than altering both and producing a hybrid.

A European critic of Indian music wrote thus in the Madras Mail nearly ten years ago :— "There is a certain class of advocates for Indian music, who, whether from real conviction, from a certain feeling of sympathy or from mere prejudice, apparently seek to exalt Indian music by comparison with its Western sister and the point which this class loves to make and to emphasise is that Indian music possesses many more

notes and far more gradations of tone . Nevertheless, it may be fairly argued that whatever possibilities Indian music may possess by reason of its quarter-tones, they are at the present time more than counterbalanced by the far larger range of instruments, the far greater possibilities of combination and the immense power of control of sound ranging from the merest whispering *pianissimo* to most crashing *fortissimo* . Could any Indian orchestra approach even in its own fashion the magnificent sweep of the Valkyries through the air or the tender murmurings of the forest in Seigfried?"

Indian music, as the critic observes, suffers certainly from many limitations. But he is very superficial in his estimate. To exalt Indian music on account of its richness of quarter tones would be as unwise as it would be to exalt its western sister on account of the larger range of its instruments. Richness in invention of stationery, i. e. pen, ink and paper will not in any way exalt a language any more than the variety of instruments would make the Western music exalted. Sometime hence steam-engines of different pitch in whistling may be used in orchestras but that would not argue any excellence in art. The excellence of Indian music consists in the fact that its melody portrays Nature and that it reveals truth, which is synonymous with beauty, while that of Western music lies in its power of combining several melodies and of expressing the outer world as well as the simultaneous outbursts of inner emotions. Western Harmony would be as grand in principle as it is now even if no instruments had been invented. The principles of Harmony are

the same in choral singing as they are in instrumental music. We should ask if any Wertern singer with all his wonderful mastery of voice real or falsetto could approach the Indian in his marvellous power of delineation of the minutest shades of emotion as possible in the thousands of Ragas that constitute of the melody of Nature. One may be without Harmony, wonderful as it is; but to be denied the beauty of Melody is to be without the very air that one breathes.

The adoption of temperament so largely used in Western music is criticised by several writers. Though its effect upon melody is to some extent harmful, it is of the greatest use in Harmony. Without it the use of several concords and more especially, the transposition of keys so grand in its aesthetic effect would have been thoroughly impossible. The uses of different voices and of instruments in different keys as tonic in larger orchestras is rendered possible by the adoption of temperament and we must acknowledge that it is the work of a genius that invented the compromise which has widened the sphere of expressin in Western music to a very high extent. Even in Melody, transposition of key is attended with its own beauty, but the modern Indian musician cares not for it; nor does he think of any improvement over the existing system. Such transposition existed in a crude way in the days of Ratnakara (13th century). In the Ramayana, Kusa and Lava, sons of Sri Rama, experts in music, are said to have sung in different keys to please the audience. This practice survives even today in chanting the Vedic hymns. The same effect is produced to some extent in singing Ragamalikas which consist of different Ragas.

Such being the difference between the two systems of the East and the West voices are heard often and loud that as Indian music is lacking in Harmony attempts should be made to *harmonize* Indian music. If done so, the resulting music would be, as stated in the Indian Journal of Education a dozen years ago 'as incongruous a mixture as would be the clothing of Apollo in a swallow-tailed coat and a top-hat.' The late Mr. Chinnasamy Modaliar observes:— "The laws of modern European Harmony which recognize no ragas at all and permit the interpolation of accidentals foreign to the melody-moulds are quite ill suited for oriental music and should never be engrafted on the chaste indigenous system. There is really no necessity to fuse the two; each system has its own charms, and can be enjoyed best on its own ground. There are inherent beauties in Harmony which deserve the unqualified admiration of all. While the great dexterity with which these beauties are brought into prominence with the aid of a multiplicity of voices and instruments and the magnificence of the effects produced by the rich combination as in an orchestra can never be duly appreciated unless a close analysis is made of the great classical works of the West. Each of these stands by itself as a monument of skill and ingenuity of the very first order owing to the plurality of forces brought together. Placed side by side with these productions, the greatest masterpieces of the East cannot but appear to sink into insignificance owing to their singularly individual and unaided character, however superior may be their charm from a melodic point of view." We fully endorse the appreciation of Western Harmony

as recorded by Mr. Modaliar. But to compare two dissimilar systems of music of the East and West would be entirely wrong.

Mr. Chinnasamy Modaliar continues,— "It is incorrect to say that no Harmony of any kind exists in oriental music; though at lonely moments of thrilling excitement and impassioned devotion neither Gods nor men can tolerate the outpourings of more than a single heart. The best aesthetic effects are satisfied in Harmony to the attraction of a combination of sounds. Generally in Indian musical performances, the vocal and instrumental parts run in unison. A continuous drone together with the drum and cymbals form the accompaniment. In Rama's time, while bands of Apsarasas danced, the celestial musicians sang to the accompaniment of different kinds of stringed instruments which poured forth their dulcet sounds in such happy succession that the harmony of the vocal and instrumental music was only perfect but executed in such pianissimo style and in neither too rapid or slow movement and in such an expressive manner that all animated creation was spell-bound." The performances described above do not constitute harmony as Mr. Modaliar thinks. Mere multiplicity of instruments or voices produces no Harmony in its technical sense unless the emotion is complex, i. e. where each instrument or voice has a different feeling to express. "The Indian system is an unwedgeable oak and the Western a soft myrtle of recent growth. While therefore it will be extremely difficult to adapt the principles of European Harmony to Indian music, the peculiar characteristics of the latter may be easily and effectively incorporated

into the former." To attempt to fuse the two systems is beyond all hope. They should therefore be studied separately. While it would certainly enhance the beauty of simple harmonic chords in Indian music, melody of the West will gain a more artistic form and thus the two systems will tend to progress in their own direction. Such attempts have been made in India in several places of which the State of Mysore deserves special mention. An orchestra of Indian musical instruments has been formed in the palace under the direct patronage of His Highness the Maharaja who is a connoisseur of music and they consist of several musical instruments such as the Veena, Jalatarang, Violin and Tabala accompanied by the vocal. The musicians play Indian music separately and in combination, meeting in the chorus. Each player has his own turn to display his skill by means of improvisations and when the chorus is reached, all the performers take part and produce a magnificent effect.

The form of music is therefore a great factor in determining the emotion. Humanity is the same throughout the world. How beloved by us are Shakespeare and Milton. Both the Indians and the Europeans are moved by the same emotions of which the expressions are the same in all places.

> If you prick us, do we not bleed?
> If you tickle us, do we not laugh? (Shakespeare)

Can a European laugh or weep in a manner different from the Indian? Emotional expressions are constant. Music is an art which expresses emotional sounds. It must therefore be one for the whole world.

CHAPTER XVI.

Graces or Embellishments.

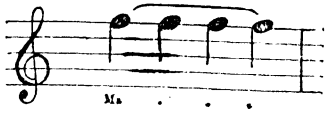
It is stated in Raga Vibodha that 'A melody devoid of embellishments is like the night without the moon, a river without water, a creeper without flowers or a woman without toilette.' Embellishments infuse sweetness and vigour into song. The object of employing ornaments in literature is well explained by Bhagavan Das thus,—

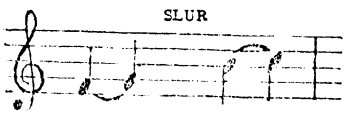
> "When the emotion aroused by the plain narrative is not sufficiently strong in itself or the pleasure corresponding to it is of such kind that the author or reader wants it to be lengthened and continued, the desire of 'ornaments of speech' is resorted to. The sole business of an ornament of all ornaments, is to put a circle, a limit, round a special feature, to put a marker on it; to thus direct attention to it and intensify the consciousness thereof and thereby define and intensify the special beauty of that feature—for, enhancement of beauty here is literally nothing else than enhancement of the consciousness of that beauty."

There are several graces employed in music. The important graces used in western music are the appoggiatura, the mordent, the turn, the shake, the slide and the staccato. We have in Indian music the *humpitam*, the *ahata*, the *linum* and the *andolitam*. Though different in name, they are the same in all systems of music.

We shall now trace the origin and significance of all these graces from Nature. Emotion, to start with, expresses itself by means of a plain note sustained for a length of time. The *tie* or *bind* is placed over or under two or more notes of the same pitch to show that

the feeling expressed by the first note is to be sustained during the time of all the other notes. When the

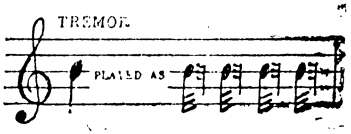




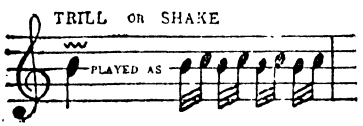
notes rise or fall in intensity the grace called the slur is placed over or under two or more notes of different pitch to show that the passage is to be played smoothly. The slur or slide gives a smooth and gentle expression of feeling to the melody. In a stringed instrument, a higher note is frequently produced on a fret by pulling back the string and the grace called the *meend* or *Varek* is obtained. This is a very beautiful grace largely used in Indian music, especially in the Northern system. It is present in the plaintive cry of the new-born babe and the leisured song of the cuckoo. But when a note merges slowly and gradually into another higher note what is called *linum* is obtained. The *linum* from F sharp to G or from B to C is very sweet. It expresses the attainment of a very calm and peaceful state after an anxious and uneasy period. In passing from B to C, all the intervening microtones an slowly skimmed over. This is an embellishment of which also the Indians are very fond.

When the agitation of the mind increases *en masse*, the voice trembles. The trill is then produced. It is the fundamental grace. Western singers seem to be more fond of it. The two notes are only a quarter-tone apart in the beginning. The trill must begin from the lower note. Real trill is correctly produced on the voice, the violin or the *Veena*. Nervousness also begets trills in the voice.

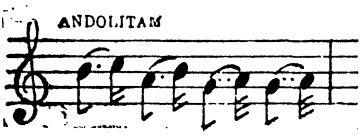
The trill should not be mistaken for the tremor commonly produced on the Harmonium thus,—



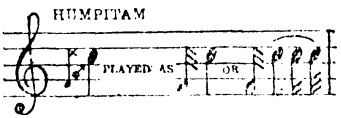
Here one and the same note is alternated with a rest, both of them being of a very short duration so as to give rise to puffs of breath as in a fast-running railway engine. Cold produces shivering which is a kind of tremor. In tremor, attention is kept up in the state of excitement. Tremor is not used so largely as the trill. While trill is soothing in effect, the tremor is tiresome. When in the trill the other note is a full or semitone above, we get the *shake* which shows that the agitation is of greater intensity and volume,



Again, if the interval is longer than a tone, the grace loses its pleasing character and becomes rather disagreeable in expression. The voice of old age is full of such shakes due to want of firmness in the vocal cords. But when the notes in a shake are only a semitone or a tone apart and the ratio of their duration is 3 : 1 or 7 : 1 we get a very sportive grace called the *andolitam* corresponding to the German *Naschang* or the after note.

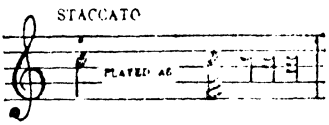


The *andolitam* expresses mirth and play as when swinging on a seesaw or driving in a spring-carriage. When added to a pathetic note it makes the feeling very soft and submissive. Of the above graces, the trill and the shake are common in joy or as well as sorrow. The slide and the andolitam indicate tender feeling such as pity and repentance. But the two graces to be explained below are used only to express anger, heroism and such like fierce outbursts. When a note suddenly dashes from one pitch to another with the sound of *hum*, the grace called *Humpitam* is produced.



The starting note is indicated by a crossed hook attached to its tail. This grace derives its force by the important place it occupies in Nature. A lion's roar begins with a humpitam. A deadly cannon ball leaves the muzzle with a humpitam. A person lifts up a weight with a humpitam. The mere sound *hum* requires effort in its production. So, when the grace is added to a note, it makes it forcible, vigorous as well as courageous. The small note is very short in duration. C in the above illustration suddenly shoots from F. When the small note is a semitone above, the grace is called *Ahata*. It corresponds to the twitch of Western music. If the interval is longer and the small note is lower in pitch, full *humpitam* is heard. Hindustani singing is full of this grace used often in an exaggerated degree.

Another grace is the staccato. A note is struck and its sound is suddenly cut off. This grace though important is overlooked in ancient Sanskrit works.



Sudden silence like darkness is very ominous. The grace signifies fear, threat, and danger. The peal of thunder is full of staccatos. The bark of an angry dog is full of staccatos. In the nature of its feeling it is opposite to *linum*. But the graces known as the turn and the mordent do not deserve separate terminologies. They are only varieties of combinations of notes,— idioms rather than figures of speech which the graces are. C B B A is as good a combination as C B D B. When a name is given to one, why not another name be given to the other? Similarly, *Prenkha*, *Udghattita*, *Hasita* and scores of such *Tanas* or combinations as well as the graces mentioned in Chaturdandi as *Vali*, *Tribhinna* and *Namita* are not graces at all. C D D A, A D D C, C D B C, A C A B and similar groups of notes add to the fullness of form to a melody while fractional notes add a sort of decoration corresponding to frill-work in embroidery or carving in architecture.

The definition of graces is clearly explained in Western music though some of them are artificial; while in India very few are the musicians of the type of Subbarama Dikshitar of Ettyapuram who seem to have a clear conception of the nature and purpose of these graces in spite of their being used everyday in practical performances. Sarangadeva's definitions are most defective and Kallinatha, his commentator is silent on this important subject as he always is in difficult matters. The graces in Western music are crushed to

death by the accompaniments. In fact, the performer being absorped in concords and discords can spare little attention separately to the use of graces. Even Miss Margaret Glyn does not seem to do full justice to this subject. Her light reference to old Celtic music shows her unwillingness to appreciate the great influence which the graces command in music. She says,—

> "Celtic imagination runs rather to wealth of decoration than to the definite utterance of the time-idiom. What is generally known as ornament in music consists of shakes, trills, grace-notes and turns too rapid to have any idiomatic significance and this Welsh music had an extensive set of signs to this effect used incessantly, the exact reproduction of which can only be guessed.' Upon this decorative principle the interest of the variations depend chiefly. It is a very primitive type, as appears from its monotony, but it is of great interest as indicating a stage in the evolution of music that has scarcely been known to exist."

The above estimate of Welsh music clearly indicates how modern musicians have overlooked the importance of these ferments in music. So learned a scholar as Fox Strangways who conducted an extensive tour round the continent of India to study the principles of Eastern music remarks in The Music of Hindustan, vide page 190, chap. 8.,—

> "Grace is so natural an accompaniment of any non-harmonic music that it may seem idle to search for a reason for it. Yet in the music of India, it is so elaborate and so integral a part of song that it is tempting to try to account for it in some way. It seems as if the language may have been at least a contributory cause. When two vowels meet in Sanskrit, except in a few special cases, they coalesce; and the

> compound thus formed was marked in the Rigveda with the circumflex accent called Svarita ('sounded') which had half-a-dozen or more names according to the particular vowels which were in question. When the Rig Veda accents (there were two others) were employed in the Sama Veda, that is, in the chant to which the Rig Veda was sung, they took the form of musical notes and the Svarita in particular, was a high note with grace attached to it."

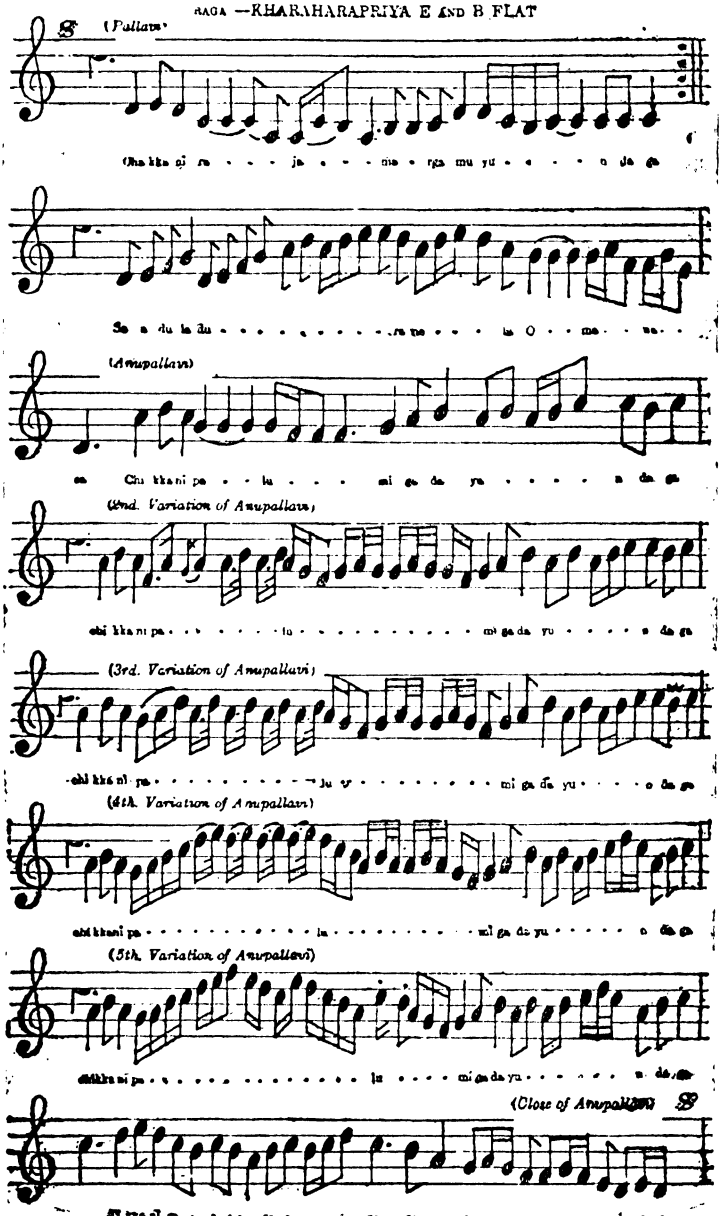
Any one who would observe the crying of a child or even the barking of a dog can easily detect any number of staccatos, slides and twitches. Would it not be interesting to know what part of the Rig Veda the Mohammedans read since they employ graces more than the Karnatic musicians? Language is never the contributory cause. It is the emotion that brings about angularities in plain voice which go by the names of graces in art.

It has been pointed out in chapter VIII that some of the musical notes are merry and some sad in expression and that the feeling of a Raga depends on its component parts. It has also been pointed above that some of the graces indicate strength and some tenderness. A pathetic Raga sounds best when tender graces are added to it. A Raga like Ramapriya, vide chapter XVIII appeals most when *Linum* or *andolitam* is used. But when a twitch or staccato is used, the real mood of the Raga is disguised and an emotion contrary to that naturally existing in it makes itself felt. In a Raga like Mohana, a *linum* or *andolitam* does not so well thrive as a *Sphurita*.

Graces have therefore most to do with giving an outward appearance of joy or sorrow to Ragas. In his

Chakkaniraja.

RAGA —KHARAHARAPRIYA E AND B FLAT



Kirtana Chakkaniraja, Tyagaraja, the sweet bard of South India, appeals in song to himself (mind) somewhat in the following manner,—

> "Oh, mind, why do you pass through the lanes when there is a royal road? Why desire an ocean of water, sweet though it be, when you have by your side the cream of the sweetest milk? Why do you go astray when there lies open to you the royal road for salvation, namely, devotion to Sri Rama whose form is so pleasing to the eye and whose name is so sweet to the tongue."

The Raga of the above piece is *Kharaharapriya* in which E and B are always flat. So the mood is sorrowful and consciousness is perfect. There are eight or nine variations in the Pallavi which are not transcribed here. The Anupallavi or sub-chorus consists of five variations as shown above. There is no decoration used in the first variation, the feeling is expressed in a plain manner. In the second, the dash from F to A makes the feeling poignant and the omission of G in it makes it all the more painful. The next moment, it is softened by the *andolitam* immediately following. The mood is now warmed into an emotion. In the third variation, the emotion rises still higher but finds vent in swings. In the fourth variation, the intensity of feeling rises to a higher degree but by means of *andolitams* the same soft strain is kept up. But in the last variation, the balance is altered, a gradual sweep of notes is introduced and at the end the flow takes a sudden turn and breaks violently into staccatos suggusting the shooting of a meteor and to its breaking up into a small number of pieces in the distant sky. The expression of tenderness previously made is here

changed into a violent outburst and in such cases one is apt to mistake that the emotion of the Rage is heroic. It is partly for this reason that Raga Sankarabharana appears to convey a pathetic emotion, page 90, when too many slurs are used. As Shakespeare has very nicely put it,—

> The world is still deceived with ornament.
> In law, what plea so tainted and corrupt
> But, being seasoned with a seasoned voice,
> Obscures the show of evil? In religion
> What damned error, but some sober brow
> Will bless it and improve it with a text,
> Hiding the grossness with fair ornament?
> How many cowards, whose hearts are all as false
> As stairs of sand, wear yet upon their chins
> The beards of Hercules and frowning Mars,
> Who inward searched, have livers white as milk,
> And these assume but valour's excrement
> To render them redoubted!

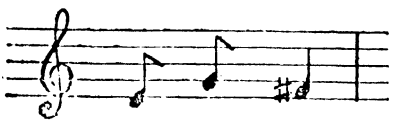
In music, the slide, the linum, andolitam impart a tone of softness; while the staccato and the humpitam add the frown of Mars and the beard of Hercules to soft tunes. Every musician has therefore to discard all ornaments like Bassanio, and search inward for finding out true feeling and beauty in his art.

CHAPTER XVII

Music and Language.

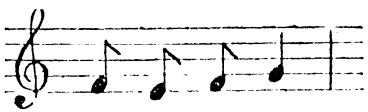
There are three kinds of languages which are quite different in nature from one another, namely, the tone-language, the sign-language and the word-language, vide page 6. Music, the tone-language, is chiefly an emotional utterance and like an algebraical expression it is capable of more than one interpretation. It is only when accompanied with proper words that its meaning becomes quite clear.

When the string of a musical instrument is plucked, it gives rise to a note which on account of its physical properties, (Vide page 30), produces a sweet effect upon the ear. Any word as *mirth* or *joy* may be set to it. But to assign to it such words as *sorrow*, *pain* or *death* would be a mistake, since a note sweet in effect cannot agree with a word of painful significance. If the note is sustained at a moderate pitch as drone, it expresses a continuous state of repose. 'I am at ease,' 'I am happy,' or 'I am at rest' is the idea implied in it. Higher semitones in the scale express the feelings ascribed to them in page 58 when accompanied with the drone and when only words appropriate to them in sense should be used. When we sing the following

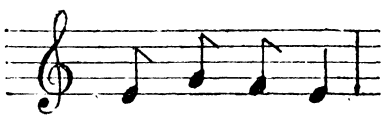


the words that could be set to the musical phrase are

'I am sorry,' 'I have lost my treasure' or 'My heart is heavy,' but not such ideas as 'Will you dance with me?' or 'I will go with my love.' To understand how the elementary ideas of enquiry, pleasure and pain denoted separately by the notes E, G and F sharp constitute one concept 'I am sorry,' the reader is referred to the fusing process of the mind as explained in advanced works on Psychology. Again,

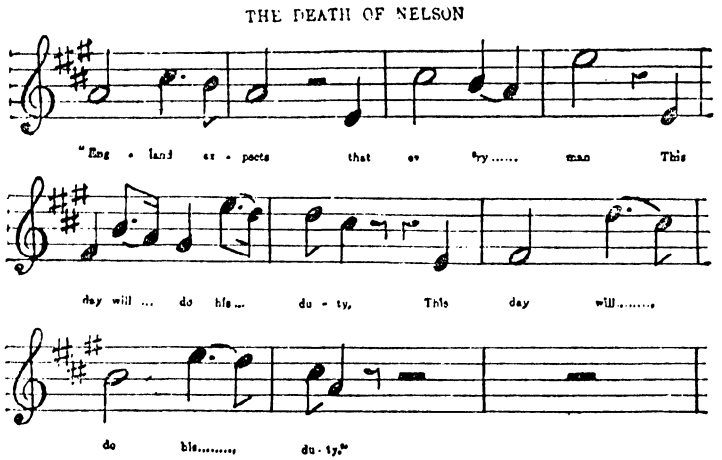


means 'I do feel glad' But in



the idea becomes an enquiry like 'How do you do?' For, in a musical expression, C when sustained represents, as it were, a full stop; G a semicolon, D, F, A colons; E and B commas. With a further change in the order of the notes, the above phrase may become quite meaningless, just as 'I shall come' or 'shall I come?' may become, 'I come shall,' or 'shall come I'. The order of words in the spoken-language is fixed by convention, while the order of notes in music is fixed by Nature. We differ from those who say, as Mr. Popley does, that the order of notes in Ragas is fixed by tradition! Notes if not properly combined convey no particular feeling except a series of isolated, tickling sensations agreeble or otherwise. Words set to music should therefore be as faithful to it in sentiment as possible. The following pieces agree very well in sound

and sense; the first is English and the other is Indian. Heroism,—



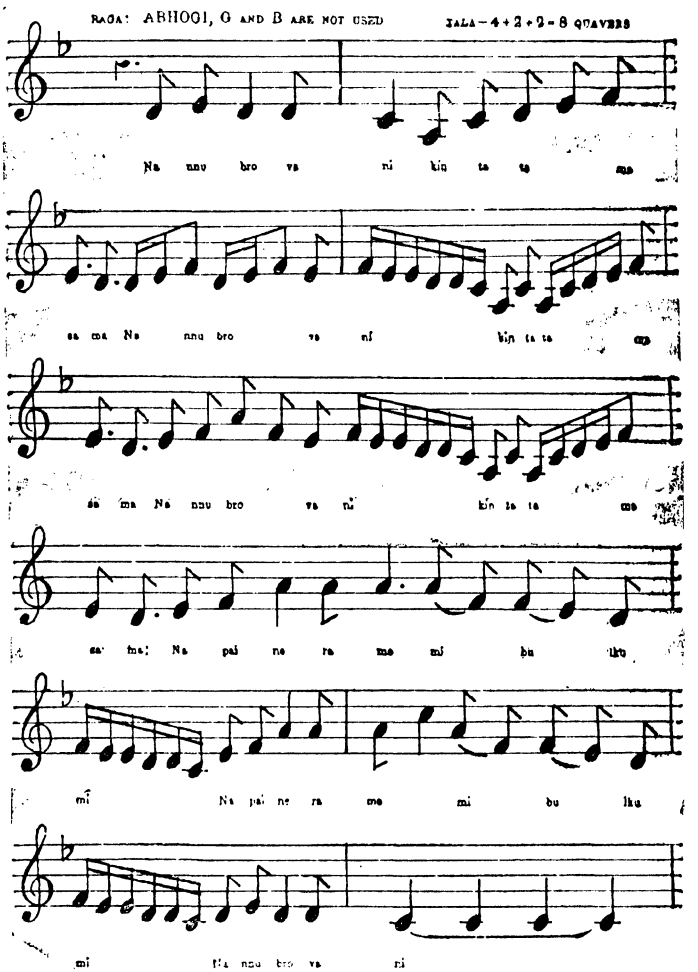
Pathos,— Compare Nannubrova on the opposite page.

Why such a delay to save me?
Say what my fault is Oh Rama!

G which expresses pleasure is absent in the Raga; to make the emotion more unhappy, E is always used flat. So the emotion of the piece is very mournful. There are certain pieces in which music is so poor and the meaning they express so shallow that it is not possible to state whether joy or sorrow is meant. In them the nature of the emotion is suggested by the language. In certain other cases we have very pathetic music set to words which signify no sorrowful emotion. We have here instances of exaggeration of feeling. In Western music, this defect is due to the operation of the second premise though the passages may be justified on the ground that they represent the outburst of passions consistent with the inner moods. In certain Krities of Tyagaraja also, there is an antagonism between music

and language. Raga Mukari is of a very sad mood. To describe in it the pleasures and virtues of the art of

Nannubrova.



music as in "Sangita sastra" is an anamoly. Similarly, Raga Saveri is full of pathos as it takes D flat and A flat. To sing the terrific effect of Sree Rama's

bow in the Raga is also improper. Such combinations would be entirely wrong if produced by men less gifted than Thyagaraja who, being a saint, knew in his life no other feeling than tenderness and no other emotion than universal love. It is also due to the outburst of the singer's temperament. In cases where it is easy to know the nature of the emotion from the sound as when a naughty child cries for biscuits, no words need be used. In certain other cases it is not possible to use any words at all especially where music expresses the motions of objects as in Wagner's music.

It is stated, not quite correctly, among all civilized nations, ancient and modern, that music is the handmaid of poetry. Poetry is therefore often set to music. The elements common to both the arts are rhythm and emotion; but there are various kinds of rhythm and various degrees of emotion. It is only in very rare cases that the two elements in both the arts fuse together. Generally, poetic rhythm is different from that of music and in union, the charm of both the arts is sacrificed for mere novelty. Best poetry does not yield to such a compromise. Nor does classical music tolerate the fetters of poetry. The combination of poetry and music often spoils the effects of both and should not therefore be encouraged.

In India, Vedic hymns were the first to be chanted to music. The rhythm was simple and the music rudimentary. Hence the combination did not reveal the incongruity. Later on, we find poetry set to music in Ratnakara. Here language rides over music. Though the theory of music had in its own way attained a high degree of development and its technique was advanced

to a bewildering degree even to modern scholars, the simplicity of music in execution rendered the combination of poetry with music possible. There existed in the music of Ratnakara a double defect. Neither did the Raga contain the emotion ascribed to it nor did it reflect the feeling expressed in the verse. The same remarks apply to the famous stanzas of Jayadeva in his Gita Govinda (11th. century). The stanzas run in different metres and the names of the Ragas are given in them. The poems describe the love-scenes relating to Krishna. Music though much emphasized is only secondary to the language, the nature of the emotion being neither specified nor cared for. It is impossible, in the absence of notation to show how actually the stanzas have to be sung and how the music compares with that found in Ratnakara. The close proximity of the dates of Sarangadeva and Jayadeva leads one to infer that there could not be much difference in the form of music of the two authors. The mere mention of the name of Raga as a guide to singing a sloka or song is thoroughly useless. Mr. Fox Strangways says that "Even in the absence of notation, it is open to any musician of to-day of sufficent skill to sing them as expressively as Jayadeva did." which is as impossible as it is to reproduce a speech of Burke though its title as well as its subject matter is known.

It is after the art of music became highly artistic in form and interesting in expression that it quietly separated itself from language, asserted its independence and converted language as its tool. In deep emotional utterances words are naturally distorted as seen while one is fondling a child. Drunken people mutilate

the language and music is a sort of mild intoxication in which the intellect is subordinate to feeling. In modern music, the great composers Thyagaraja and Tansen adopted prose completely and used language as 'a peg upon which to hang emotion.'

It is true that in Western music the range of subjects dealt with is far more varied than in the East where only the erotic and the religious feelings are expressed. In the former the comic, the erotic, the heroic, the religious and several other feelings are expressed. We must here point out the fact that music deals with emotion already mature while poetry deals also with emotion in the making. While in poetry intellectual beauty predominates over the emotional, the reverse is true in music. Until emotion reaches a particular pitch, like the boiling point of water there can be no vocal resonance and it does not burst into song. Because in the West the sound-element in music is more attended to than the sense-element any piece of poetry is set to music. For instance,—

1. MY OLD FRIEND JOHN.

It is forty-years since, my old friend John
You and I were young.
Bird-nesting through the forest glen,
What merry merry lays we've sung.

2. THE VILLAGE BLACKSMITH.

Under a spreading chestnut tree
The village smithy stands.
The smith a mighty man is he
With large sinewy hands.

The above lines have been set to music by different composers. We have the greatest regard for the virtues of friendship and duty. Still we hold that they are fit only for poetic representation but not music as the emotions are not so intense as to burst into music in accordance with the laws of psycho-physical parallelism. Nor will the props *con brio*, *piu lento*, and *agitato* raise the emotions to the required pitch. Emotion to burst into music, should traverse beyond the limits of the psycho-physical. Otherwise even such doggerels,—

> Thirty days have September
> April, June and November.

might as well become suitable themes for musical ebullition. Also the verses of great intellectual poets like Shelley or Browning which inhibit emotion under the operation of the intellect scarcely lend themselves to musical setting. How can one effectively sing the following from Shakespeare!

> All the world is a stage,
> And all the men and women merely players,
> They have their exits and their entrances;
> And one man in his time plays many parts,
> His acts being seven ages.

In the light of the above facts it is not possible to bring many subjects within the scope of musical treatment. Only the erotic and the religious (to a lesser degree the heroic also) are the emotions that are best fitted for music. The parental, the filial or friendly affections run in a smooth and perennial course and do not usually rise to the extent of giving rise to sighs and sobs and tears. A child may weep for its mother, but a grown-up person cherishes inward affection or

sorrow. Still less do the feelings of sympathy, gregariousness and love of the natural scenery by themselves constitute proper materials for treatment in music through song. It is the intensity and not the quantity as in heat that kindles emotion into the flame of real music. But it must be admitted that to the Western artist a new field is open through instrumental music and the Europeans certainly possess 'an inexhaustible wealth in Harmony' as observed by Mr. Hipkins.

The remarks made above apply to music for adults. The range of subjects for juveniles may however be very wide. The intensity of emotion is no criterion. The young mind is carried away by sweet tones and takes a good deal of delight in singing such songs as are used in the Kindergarten games. The following piece would very well serve for juvenile music,—

LITTLE JACK HORNER.

Little Jack Horner sat in a corner,
Eating a Christmas pie;
He put in his thumb, and he pulled out a plum,
And said, "What a good boy am I!"

NURSERY RHYME.

CHAPTER XVIII

Time, Pitch and Rhythm.

When stirred up by such powerful emotions as heroism or anger, bodily activities go on in a rapid manner; in normal states they are moderate, but when sorrow oppresses the mind, a state of weakness affects the body and its movements go on slowly. Time (Kala) which indicates the rapidity of notes in Indian music is of three kinds:—slow, moderate and quick, known as Vilamba, Madhya and Drita. All merry, jovial and heroic songs are in quick-time and funeral marches proceed slowly. Milder emotions run with moderate rapidity. Such words as adagio, andante, presto, accelerando are used in Western music to denote varieties of pace; and such words as piano, dolce, and forte to indicate pitch or intensity.

Rapid speed is attended with an out-put of greater energy which raises the pitch of the voice, while slow time leads to a diminution of energy and low pitch. Quick time and high pitch are signs of merry, heroic and angry moods; while slow time and low pitch indicate dejection and sorrow. Throughout all these shades of pitch and time, there runs another factor which regulates the pulses of emotion and stimulates the attention step by step from drooping into apathy or inaction. That factor is rhythm (Gati). It represents the succession of waves in the flow of emotion which would otherwise assume a calm and even morbid state.

Rhythmic action underlies all Nature's work. It

is only a form of the universal vibration of matter. Its perception is instinctive with man. The regular recurrences of the seasons, of the months, of night and day, impress themselves upon his mind from youth. The motion of the limbs, right and left, the beat of the heart and the respiration of the lungs accustom his body to the influence of a rhythmic force. One-two, one-two, one-two, is the principle and elementary rhythm that strikes the ear forcibly. We may also mark one-two-three, one-two-three or one-one-two, one-one-two—and thus vary the rhythms. The movement proceeds by swings and the melodies receive a peculiar beauty and force under the influence of rhythm.

Music exists in two forms,— one with rhythm and the other without it, corresponding to poetry and prose in literature. Raga-Alapana has no limitations of rhythm, though its parts should be well-knit together and neatly arranged. It lacks the coherence of a barred passage. There is a natural grace about it like that of a wild flower. It is unbridled in its movement. Under the shackles of rhythm, music acquires precision and trimness at the expense of the freedom of movement.

One hundred and twenty varieties of rhythms (Tala) are mentioned by Sarangadeva. Another authority gives one hundred and eight. Later on, thirty-five came to the front, though in practice only a dozen are used. All the rest exist more for academic interest. They fall under five divisions,—duple, triple, quintuple, septule and nonuple. Of these, the nonuple is very rarely used. In every division of time called a bar or *avartha* there are a number of units of or *matras* some of which are accented. The duple time has two units

in a bar. It is the rhythm of Nature, of the vital feeling. The quadruple time is only a reduplication of the duple time running in a calm and dignified manner. See Yaduta-Nilachite, page 83.

But the triple time especially when the unit is a quaver keeps the mind most attentive. The quintuple time is less exciting though the mood is one of agitation. The septuple time combines the dignity of the common time as well as the agitation of the triple time. The mind enjoys brief pauses of rest if the notes are arranged in groups of three and four. See Gachiyunna page, 90; but if the bar is treated as an inseparable whole of seven notes or units, the tension of emotion becomes very great. In the compositions of Shama Sasttry, expert in the use of such rhythms, the mind stands on the tip-toe of expectation, suspense and anxiety.

In a melody, the structure of which is based upon one kind of rhythm, other varieties are used to indicate a temporary change of level in the course of emotion. For instance see Narasimhudu, page 107. It contains a tilt in the nature of rhythm introduced for mere aesthetic effect. The change of rhythm indicates a sudden out-burst of a new phase of feeling which like a meteor flashes on the mind and disappears the next moment. Sometimes the rhythm is changed in order to intensify the sense expressed in the context.

In Western music, instances of simultaneous use of duple and triple times are found chiefly in the works of Beethoven where the melody is in duple and the accompaniments in triple time. "The use of two opposing species of rhythm at the same time is one of the paradoxes in which music delights." To mark one time

with the right-hand and another with the left is considered as a skilful and exciting feat in music and in no other system are such feats carried on to a most wonderful extent as in Indian music. The drum used in bands or orchestras in the West only adds a few sounds which mark simple rhythm. But in Indian music it is developed into a separate science so elaborate that one should devote the best part of one'e life-time for acquiring proficiency. Alahanamby and Tukaram are famous experts in the art of drumming in South India. Sometimes an earthen pot (Ghata) giving out a sweet sound is used instead of the drum and Anathacharya of the Mysore palace was an able exponent of the art.

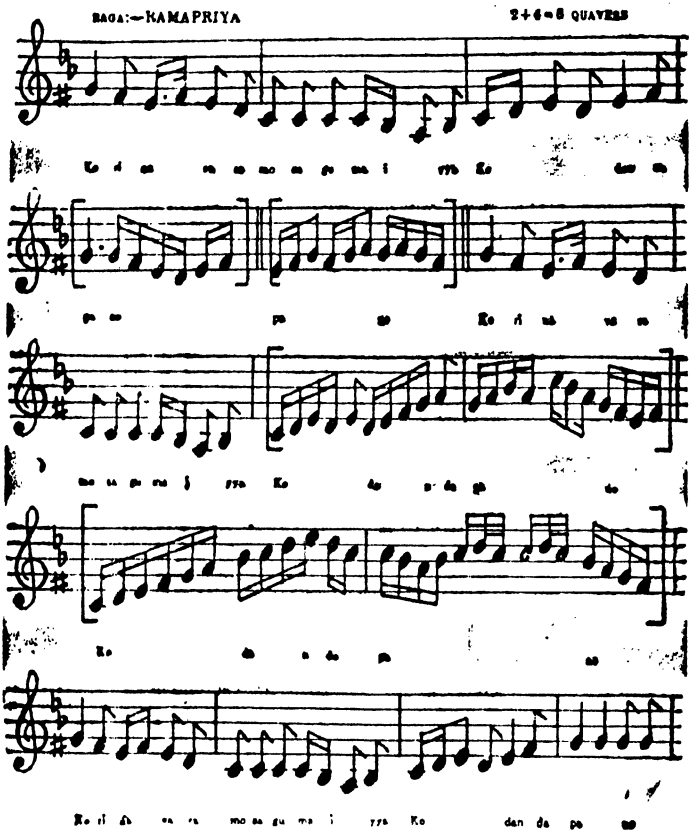
The resonance of the Indian drum is bewitching in effect when tuned in unison with the drone. "It intoxicates the mind" says Kalidasa. In addition to the sweetness of sound, it expresses all shades of pitch and intensity. A new arrangement of drums— "The Tabala Tarang", devised by professor Abdul Kareem of Poona consists of a number of Tabalas tuned to the notes of the scale and any melody may be played on it as on a piano or a sitar. The drum, in Indian music fills the place of accompaniments in the real sense. If in the West, simultaneous sounds disguise and sometimes kill the sense of the melody, the notes of the drum intensify it. The sound of the Tabala is in general sublime. The Tabala with its left half or the Mridanga produces all kinds of emotions,—heroic, wonderful, ludicrous and pathetic. In fact, the Tabala can express a greater variety of emotions than any other musical instrument. What in the Western system can be expressed by means of a number of instruments

a single Tabala in the hands of an expert can accomplish. The roar of the lion, the gust of the hurricane are very easy of expression. If the scherzos to symphonies are capable of expressing humorous sentiments, the Tabala is the instrument which does the function very efficiently. The Tabala imitates the sounds of laughter, fun, mimicry, sarcasm, consolation, and of every other sound which can give rise to a feeling of the beautiful, the ludicrous, the sublime or the humorous.

Rhythm, pitch and speed are therefore very powerful factors which disguise or alter the nature of the emotion expressed by the notes or the words set to them. To ascertain therefore the mood of a particular musical passage, strip it gradually of its language, its accompaniments, its graces and then its time. Just as a chemist tests a salt with various processes of analysis or as a gold-smith examines a jewel by weighing, rubbing and even melting it in a pot in order to know the nature of the metal, a musician should discard all appearances and ascertain the emotion. Take for instance the keertanam in Ramapriya in the next page.

A devotee suplicates the Almighty to grant him his desired boons. What is the emotion that the piece expresses? At the time of prayer, he may be in sorrow, or in joy, in an anger or in a quarrelsome mood. The words do not specify any of these emotions. The tala of the piece is Rupaka and there are only six units of time in each bar running in short and rapid clusters. So, we may infer that the emotion has an element of impatience. The notes used contain F sharp, D flat and B flat. The sharp note indicates intense physical pain, D flat shows disturbance in semi-consciousness and

a desire to attain a state of physical rest, and B flat indicates intellectual uneasiness. Thus in the stream of



consciousness exhibited by the Raga, there are three painful elements to render the emotion—a sorrowful one. The presence of E and G soften the feeling to some extent though not much. How shall we call this emotion? *Melancholia-paena-supplicatum?* Is not the name funny? Is it not analogous with *Pulvis creta aromaticus* in medicine? It may be funny only till psychologists ratify it.

CHAPTER XIX.

The Art of Dancing.

The art of dancing is treated by all the Indian writers as a part of music. Both music and dancing, it is true, arise from the same cause, namely, emotion. Both are the manifestations of the law of psycho-physical parallelism. In singing, the emotion extends more to the vocal cords; while in dancing, it is more violent and spreads over all the muscels of the body. But music always implies sounds of varying pitch, whereas the sound-element is entirely absent in dancing. Hence dancing being an independent art from music cannot be a part of it. Music is the tone-language and dancing is the sign-language; they should therefore be separated from each other.

The art of dancing too has its root in Nature. Look at a child of two or three years of age. When you tease it, it dances with fury and kicks its limbs about violently. A woman stricken with sorrow rends her hair and beats her breast. When elated with joy, a peacock struts with all its plumes spread out. So does a dove coo round its mate. Even the calf and the donkey throw their hind legs into the air and circle round and round in a sportive mood. Dancing is therefore common even to the birds and the animals.

Dancing is an imitative art. If music imitates the inflexions of voice in emotional conditions, dancing imitates the various gestures under similar circumstances. It draws its materials from Nature;—to bite one's

lips, to shrug one's shoulders, to nod one's head, to bow, to duck, to bend the knees, to knit the brow, to frown, to smile, to look askance, to stare, to wave one's hands, to beckon, to shake the fist, to tremble, to smack, to dally like a flower, to stretch one's hands, to break the knuckles, to clap one's hands, to receive with open arms, to give and take, to count one's fingers,— of such elementary gestures is the art of dancing composed.

It is rightly said that the face is the index of the mind. Every mental phenomena has its counterpart in the body and the musical notes also produce particular facial expressions. Sa or Do expresses repose and all other semitones have their own particular pictures. Every Raga may be represented by a picture which is not an immovable one, but a changing scene (as the Raga developes) as seen in a cinematic show. To represent the pictures of Ragas, we need not bring Siva or any imaginary being like the sphinx. Any ordinary mortal will show on his face all the emotions that stir the heart. For convenience, examine the picture of Menaka and Viswamitra, page 122 A.

Judging from a musical point of view, we find that the baby Sakuntala is fresh born, and is unswayed by emotion. The tender baby must be in a condition of 'deep sleep' to represent the shadja or the first note of the octave. No raga suits its voice. It cries only within a range of three or four notes (S, R, G, M), but these four notes only do not constitute any raga. In being lifted up in the air rather in an uncomfortable manner, the intelligent baby has opened its eyes wide and exhibits the note R_2. The facial expression of Menaka is very

attractive. It is not tranquillity, so it is not S. It is not mere disturbance nor perception; so it is neither R_1 nor R_2. She does not mean uneasiness, for she is in a more advanced state of emotion than in G_1. But she is in the mood of enquiry, or of ascertaining from the Rishi whether he will accept the baby as his or not. Her countenance does not represent M_1, for there is no egoism in her as when she enticed him; she is now his wife and subordinate. M_2 is not the expression, for she is not despondent. Hence her face must represent G_2. If Viswamitra had acknowledged the child as his own, and if he had been pleased, as a father with his child, his countenance would have been merry and indicated P, and the three faces would have represented the major chord SGP. But now the child is staring, Menaka is enquiring, and Viswamitra humbled; the three faces indicate R_2, G_2, M_2, which sound as discordant to the ear as the picture is to the eye.

At this stage of description, it will be easy to see how imaginary are the pictures given in ancient works to illustrate the Ragas. For instance, '*Bhyran* raga is represented by Siva. *Sindhee* is represented by a female figure, who is clothed in red garments. *Gouree.*—This young brunette has adopted the blossom of the mango for her ornament. She is endeavouring to sing her favourite melody, but is too infatuated and intoxicated to proceed with it. *Lulit.*— It is not satisfactorily explained why this fair creature, who is so overpowered with grief by the absence of her lover, should decorate herself with all her finery of dress, jewellery and flowers. *Depuk.*— The flame which the ancient musicians are said to have kindled by the performance of this raga is

depicted in his fiery countenance and red vestments. A string of large pearls is thrown round his neck, and he is mounted on a furious elephant and accompanied by several women.' Neither the feelings of notes, the emotions of the Ragas nor their correct physical expressions according to the laws of psycho-physical parallelism have been taken into consideration in the painting of these pictures. Nevertheless, it is quite possible to explain scientifically any picture by means of a raga and conversely draw a picture to represent any Raga.

One difference that exists between the Indian and the European systems of dancing is that while the former imitates the natural, the latter consists of artificial gestures. The movements of the feet, the palm and the hands are all artificial. They are gymnastics; so is the posture of the body. The naturally bewitching coquetry of the eyes, the swinging of the head, as well as the movements of the facial muscles and other limbs do not enter in its exposition as in the Indian art.

Opinions are different regarding the dignity of the art and its fitness for introduction into enlightened circles of society. Kept within proper bounds, dancing is an ennobling art and a pastime. Instances in our sacred works are not wanting of Lord Siva having engaged himself in the dance called Tandava in which many other gods took part.

CHAPTER XX

Music and Education.

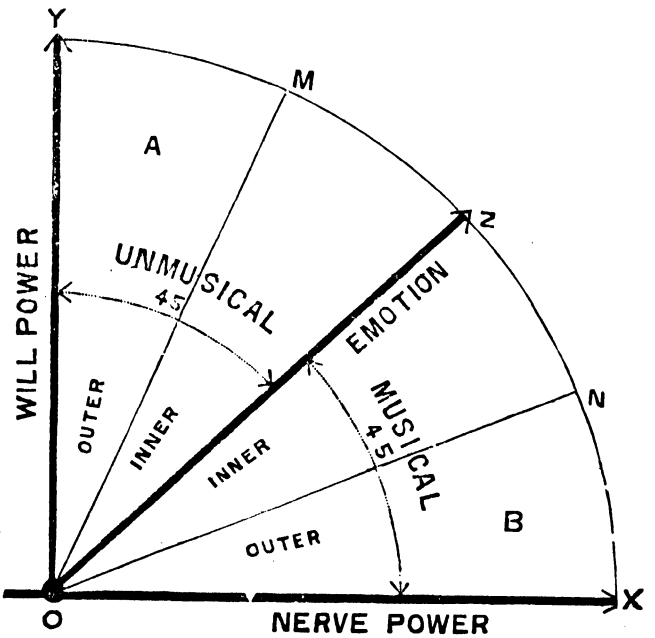
Emotion like heat or electricity is a form of energy generated in the mind. Its effect depends upon the quality of the nerve-substance through which it passes. If the substance is a good conductor, if we may use the term, the body is thrilled with emotion. Love, joy, pity, kindness, fear, anger and hatred,—all these find a ready response in a person of soft nervous constitution and he is carried away by the stimulus. He is irritable, sympathetic and even hot-tempered. He is a mirror of reflection of every feeling in his neighbour, whose sour face and merry laughter find an echo in him. Music exercises its powerful influence on a person of this nature and he appreciates the art full well; and it is to such an individual and to him alone that music becomes intelligible. His sympathy extends over the animal and the vegetable kingdom. 'On seeing a wounded hare limp by him, which a fellow had just shot at,' Robert Burns was so much moved that he broke into song, thus; —

Inhuman man! curse on thy barbarous art,
And blasted be thy murder-aiming eye,
May never pity soothe thee with a sigh,
Nor ever pleasure glad thy cruel heart!

... ...

Oft as by wandering Nith, I, musing wait,
The sober eve or hail the cheerful dawn,
I'll miss thee sporting over the dewy lawn,
And curse the ruffian's aim and mourn thy hapless fate.

Where nerve-power (sensibility) preponderates, sudden outbursts of joy or sorrow are emitted, though they may be cooled down as soon as the current passes away. Where sensibility and will-power are equally balanced, the result is not perceptible. Where the nervous substance is a non-conductor of emotion, it absorbs emotion slowly and retains it for a long time. The reflex-action is so slow that it does not move the muscle to any active work. When a strong will is animated with a good motive, the result is a mechanical display of feelings. But if it is influenced by an evil design like that of Iago, it can harbour and develop its schemes of wickedness and consummate them with great deliberateness to a successful though dangerous end.



Angle XOY is 90 degrees; YOZ and XOZ are 45 each.

Let us now consider the struggle that goes on in the human frame between will-power and nerve-power under the influence of emotion. Let O be the origin or source and OX represent the line of nerve-power. From the centre O, at the distance OX, draw a quarter-circle. Consider the area XOY. Millions of radii diverge from O to the arc, and each of these lines represents, as the resultant of the will-power and the nerve-power, the emotional nature of individuals of various constitutions and temperaments. When the two powers (nerve and will) are equal, the line of motion OZ besects the right angle XOY and represents a well-balanced mind. The more the line OZ moves towards OY, will-power becomes stronger and the nerve-power weaker. Softer feelings disappear. A man of stern disposition grows more and more hard-hearted and passes through the stages of bad, wicked, cruel and murderous. He is not moved by music. As the line OZ moves towards OX, the will-power decreases and his sensibility increases; he yields more and more to emotion. His sympathy extends its sphere. He becomes soft-hearted. He is carried away with music. The angle XOZ may therefore be called the musical angle and the angle ZOY the un-musical angle. Man's nature may be judged by the position he occupies in the figure and it is the resultant of his nerve-and will-powers, i. e., power to control himself and to yield to the influence of emotions.

When Shylock demanded a pound of flesh from near the heart of Antonio, was there any tenderness in him? He knew that pain and death would ensue by cutting open a live person. His thought of pain did not rouse in him any feeling of sympathy. There was no

sensibility in his nerves but he had an iron-will. His was a constitution that should be given a place near A in the unmusical angle, nearly 85 degrees removed from OX. On such a person the strains of music would leave no empression as a shower of hails on a rock. He is wholly unmusical. On the other hand, under the instigation of king John, Hubert determines with a strong will, standing at 90 along OY, to put out with the help of the executioners, the eyes of young Arthur and says to them,—

Hubert :—Heat me these irons hot, and look thou stand
Within the arras; when I strike my foot
Upon the bosom of the ground, rush forth,
And bind the boy you shall find with me
Fast to the chair; be heedful; hence, and watch.

... ...

Arthur :— No, indeed, is't not, and I would to heaven
I were your son, so you would love me, Hubert.

Hubert ;—(aside) If I talk to him, with his innocent prate
He will awake my mercy which is dead;
Therefore I will be sudden and dispatch.

These lines show how Hubert, naturally merciful, had by a strong determination subdued his better parts. But now, at this stage, he comes down from 90 to 75. When the warrant of death was shown, the boy says,—

Arthur :— Have you the heart? When your head did but ache
I knit my hand-kerchief about your brows,
The best I had a princess wrought it me,
And I did never ask it you again,
And with my hand at midnight held your head,
And like the watchful minutes to the hour,
Still and anon cheered up the heavy time,
Saying, 'what lack you? and 'where is your grief?'
Or 'what good love may I perform for you?'

Moved by such appealing words, Hubert gradually comes down to 45° and says :—

Hubert :—Well, see to live, I will not touch thine eye,
For all the treasure that thine uncle owes.

How reasonable was Hubert and how kind ! Of such constitution and temperament are those that are influenced by music. The more a person approaches the line OX, the more merciful he will be and the more soft-hearted; and a reflex-action through the line would result, in the absence of control through the will-power, in heart-break to which only extremely nervous people are subject, or in suicide as in the case of Romeo and Juliet.

The power of music to change the state of the mind from one emotion to another as well as of the body is well exemplified by Dryden in his Alexander's Feast.

The praise of Bacchus the sweet musician sang.
Of Bacchus ever fair and ever young
The jolly God in triumph comes.
Sound the trumpets, beat the drums !
Soothed with the sound, the king grew vain,
Fought all his battles over again,
And thrice he routed all his foes and hence he slew the slain !
The master saw the madness rise,
His glowing cheeks, his ardent eyes ;
And while he Heaven and Earth defied
Changed his hand and checked his pride
He chose a mournful muse
Soft pity to infuse.

By means of proper education in music it is possible to leaven the human frame in a way that it may respond to the outside influence in a beneficial manner. The word Education is derived from Latin e = out,

duco = lead. Its object is to lead out one's innate qualities and improve upon one's natural aptitude. The definition cannot hold good in all cases; for, every person is not born with the same qualities. Some are born hard-hearted and some good-natured. The method of education must therefore vary with individuals. It must be positive as well as negative. If the angles YOZ and XOZ are bisected by the straight lines OM and O N, the angle M O N represents the angle into which every youth must be lead by means of education. Persons as stated above are born with different degrees of will-power and nerve-power. They differ in nature as metals do. While iron should be softened by heat, gold should be hardened by alloyage. In the case of persons stationed at A in the figure, the nature of the education must be of a negative kind, calculated to bring down their adamantine tendencies and in the case of those born at the point B, its aim must be of a positive nature. In either case a youth must, by judicious means, be led out of the outer angles Y O M and X O N and put in the angle M O N as near O Z as possible. In the case of those born in the angle M O N, their innate powers may be developed on the principles of education now in vogue.

Ancient Greeks educated their children in music so that they might grow kind and unselfish to their fellow creatures. Educationists like Froebel and Montessori advocate the introduction of games with music for boys and girls to develop their various good faculties and also control their wild tendencies. The tone-language should therefore be used as the principal medium of instruction in the early part of life. The nervous sys-

tem will thereby be regulated and it will contribute to muscular development. The sign-language, consisting of different signs, ought then to follow in its two-fold divisions of dancing as an art and games and athletics as a science, thus making physical education a very important factor. The word-language which aims at training the intellect should be the last kind of instruction to be imparted. It is therefore of the greatest value that music should be the first item of instruction in the educational curriculum of every country and gymnastics the next. These two branches develop a sound body in which a sound mind finds a very congenial home. But the nature of the music introduced and the words set to it have to be such as to further the objects of education. Martial spirit should be infused into the weaker souls and a feeling of tenderness instilled into turbulent characters. By appropriate songs, the object of training should be to bring about an equalisation of the nerve and the will-power, or equalize the physical and the mental cultures.

An unmusical person near A is, as a member of society, a mechanical being. If he is well educated he may reach OZ. He does everything as a duty. He is devoid of sympathy, much less of pity. He is hard-hearted. He is deep in thought, reserved and stratagic. Musical training in his case tends to soften his feelings. Judicious musical instruction, begun at a proper age, does much to train the nerves and sow the seeds of sympathy into the very substance of his constitution.

An unmusical person without education is worse than a brute. He, like Shylock, is a danger to society. Of him Shakespeare says:—

> The man that hath no music in himself,
> Nor is not moved by the concord of sweet sounds
> Is fit for treasons, stratagems and spoils;
> Let no such man be trusted.

It may be enquired why the poet did not use the following form of expression,—

> The man that hath music in himself
> And moves others by the concord of sweet sounds,
> Is not fit for treasons, stratagems and spoils;
> Let such a man only be trusted.

The reason is that the original text involves a caution to the musician and consolation to the layman. A strong-willed person may become a clever musician by studying the art. But having no predisposition to soft nervous impulses he, like the emperor Nero of Rome, who was playing the violin when the city was on fire may be a traitor and tyrant; while a sympathetic person, being always engaged in busy pursuits of life, may not be able to cultivate music, though his nerves are tender, pliable and impressionable and he may still be a kind-hearted person. It is therefore an unmusical and uneducated person that is really dangerous.

A musical person with a sound general education is an ornament to the society. Stationed on the line OZ he can oscillate like a pendulum between OX and OY according to circumtances. He it is that knows the right and the wrong. He feels for the sick and helps the poor. While the unmusical person dresses a wound like a surgeon, the musical person feels as if he himself sustained it. The motive for doing good proceeds in him instinctively while that, if it exists at all, in the unmusical person, is based on judgment.

Such a musician is a real friend, a dear partner, a loving parent and a loyal subject.

Lastly, a musical person without education is generally a man without principles. Vice and virtue appear alike to him. He is propelled by instinct. Reason is at a discount. Being near to OX, he can hardly approach OZ. He may have many good qualities.

But every rule has an exception and the general statements made above do not apply to certain individuals. Capacity to like or learn music and appreciate the art depends upon several physical conditions. Every impression has to pass through the tympanum, the middle ear, the sensory nerve and the brain before it can extend its influence over the body along motor nerves. These different physical agents concerned in the production of a musical effect must be healthy. A defect in any of these stages may vitiate all the statements made above. We have among us eminent professors of music who cannot put two strings in unison owing to bad tympanum. We have also musical experts who owing to some other kind of defect cannot keep the 2-4 time either when they themselves sing or when others do so. A perfect musician is one who is free from all such blemishes. Such a man is a genius.

Religion, it must be added, forms in combination with music, another means of improving the character of man. The seeds of religious education are found in Nature. They are sown in him at a very early age, while yet he is an infant. He is impressed with the grandeur of the sun, the moon, the stars, the wide expanse of the ocean and the lofty mountain ranges. All these create a sublime feeling in him; and as he

advances in years his mind develops in the direction of enquiry. Till his very last moments, he is engrossed in the admiration of the natural phenomena as the mighty manifestations of the Unknown in comparison with the imbecility of his own poor self. Every man is thus stirred up with religious emotion, and music, if added to express it, blends most harmoniously. Religion and music are each capable of softening the beastly qualities of man and a combination of the two is sure to bring about very beneficial results.

Religious instruction succeeds even where music fails and it can tame also unmusical persons. General education produces no effect upon a class of unmusical people whose wicked tendencies do not yield to cold precepts. They may be called fanatics. It is only a religious feeling that can make them social and sympathetic. In several cases, religious training improves a man's character and it does so much better if united with music. It is not true that music is born only of religious feelings. Music expresses religious emotion just as it does any other. The connection between music and religion is so time-honoured that the two appear as though inseparable; religious worship was accompanied with some sort of music even when man was uncivilized and the history of every nation ancient or modern shows that sacred songs formed an important factor in church service.

Of late, music has become more the monopoly of sexual love, which in primeval days had not attained that degree of refinement which the etiquette of modern civilization has called into existence. Primitive man was nude and love was based upon instinct. As time

went on, silk and muslin replaced the barks of trees and skins of animals. Social rules were framed and they regulated the conduct of the sexes to each other. Taste in speech, in gait, and dress attained a high degree of perfection so much so that each of these adjuncts of life came to be looked upon as an accomplishment with volumes of treatises expounding their niceties. Under these circumtances courting became an art and love a mystery. Its pains and pleasures served as themes of poetic effusion and music soon lent its helping hand to its achievements. It was often used more to fan the flame of love than of religion and then it became of a degraded art. Still, for purposes of education, it is necessary to combine religion and music as in the Bhajans which are in vogue in India to-day as the best form of such a combination. A perfect system of education must be based upon music, gymnastics, religion and general education.

A country in which music does not flourish is far behind in the scale of civilization. Its people are selfish and inhospitable and wanting in that trait of character which makes them love and be loved by others. Music is love and it is desirable that the prince as well as the peasant should cultivate the art. The country in which the ruler is musical will be happy, contented and prosperous; for, he rules not by the force of his sceptre but by his heart which finds a ready response in every subject. Instances may be given from history to prove the fact that a musical sovereign has been generally a great benefactor to his country and his people. In fact the state is a body politic, the governing power represents the brain and the subjects so

many nerve centres. The sovereign of the state can exercise a powerful influence upon them, since mutual sympathy depends upon the way in which they are educated. They resonate to the vibrations transmitted to them from the brain and a reflex action, for better or for worse, is established in them.

Though the advantages of instruction in music combined with the physical are patent to every one, the system of education all over the world, especially in India leaves a wide gulf between the two branches of education. The brain is cultivated and the body neglected to a deplorable degree. The rising youth grows therefore, precocious in intelligence, becomes more sensitive, attains majority while young and dies a premature death with a shattered nervous constitution. As long as our college buildings taper to the skies in the direction of O Y and leave the gymnastic halls on the ground-level in the direction of O Z, the pretensions of higher education are hollow and its advantages superficial. When will our universities rise to the level? And when shall we have compulsory music and physical examinations which will befit the student for his various duties and responsibilities in the world?

CHAPTER XXI

Music and Notation.

Notation was not used in India for recording music till very recently. The notes Sa, Ri, Ga, etc, existed only for purposes of singing. They were however written in a crude form for illustrating examples in Natya Sastra, Ratnakara and other works. No attempt had been made to make the symbols represent the sound in all its delicate shades. With the advance of time, a desire for adopting an accurate system of notation has been felt.

The elements that should be represented in writing are *pitch*, *time* and *grace*. If the potentialities of the human mind to assimilate impressions and also use them for further progress are recognized, an elaborate system of notation is not at all required for Indian music. In the scale, there are twelve semitones. They can be written clearly as S R G M as now done. Their pitch, whether full, half, or quarter, may be indicated in the key-signature at the top; and any accidental, which is rare in Indian Ragas may be shown then and there. Since the system is melodic, only one line-writing will be quite enough.

The marking of *tala* is also easy. Generally, notes have to be represented in six velocities and by adding a dot to lengthen a note by one half, any intermediate duration can be fully represnted. S, Sa, Saa, Saaa may be taken to mean one, two, three or four units and

S̄, S̈, S̃, to mean half, quarter and eighth notes. Gati also may be shown by grouping notes together.

The next item of representation is grace. If time and pitch are accurately shown there is scarcely any need to mark the graces. Experience is its own guide and if good music is often listened to, almost all the graces like humpitam, kampitam and andolitam come of themselves, provided their definitions are fully studied and their use clearly understood.

A child feels it very difficult at first to read A MAN, A TENT, AN ANT. After some practice, it can easily read 'I met a man,' 'He was in his tent.' Gradually, it assimilates the compound sounds of letters and though the notation is the same, it can fluently read any passage with graceful intonation. The eye supplies all impressions to the mind at first; these are stocked in the brain to be used later on. The faculty of apperception comes into play and the mind takes the burden upon itself to sing or read a passage correctly even if there are mistakes in the writing. It is apperception that encourages spelling-mistakes in proof-reading. Compare how the mind favours a familiar notation in preference to one more phonetic as transcribed in the following lines,—

There is a tide in the affairs of men
Which taken at the flood leads on to fortune;
Omitted, all the voyage of their life
Is bound in miseries and shallows. (Shakespeare)

Re-written,- Theer iis e taid in thi affeers aaf men
Which teeken at the flad liids aan tu faarchuun;
Omited, aal the voyeej aaf theer laif
Is baund in miseriies end shaalos.

(a, e, i, o, u should be sounded as in but, met, pin, so, put)

The staff notation as adopted by Chinnasamy Modaliar is very useful. Though accurate, it is very cumbersome. It will become more complicated and less useful if the sruties also are marked, or if the notes are written in small fractions as units. The tonic-solfa notation is very convenient, but it is not so good as the Sarigam notation now popular in India. The Indian musicians, especially in the South, practise the singing of the notes so much that their mere names carry the voice automatically to their correct pitch. A trained musician can read a passage as fluently as any newspaper.

There is no artist in India who has written music so graphically as Subbarama Dikshitar of Ettyapuram. The learned professor has recorded the pitch, time as well as grace most accurately. Since the work is in Telugu, it is not useful to the public at large. Still, any attempt to improve upon it or disregard it would only argue the ignorance of the innovator. But there is no need to use such an elaborate system in the beginning or after a certain stage of advancement. There are several books published recently with the time and the pitch of notes marked correctly. The Music Self-Instructor published by Venkatesa Sastry of Madras may be taken as a good specimen. If music is taught from the initial stage with the aid of notation and if it is frequently used both by the teachers and the taught, there is no necessity to invent any complicate symbols. Indian music is a mere representation of what is in Nature. A simple notation accurately showing the duration and pitch of notes is all that is required for the Art.

CHAPTER XXII.

The Mysteries of Music.

When the rationale of any work of art or science is not manifest, imagination steps in its place and supplies a number of fantastic theories which in the absence of scientific investigation multiply like weeds. By superstition, magic and mesmerism were once invested with supernatural powers. So was witchcraft and witches were considered as having had control over the elements of Nature. Why! The steam-engine was, till quite recently, believed that it was propelled by a spirit lurking in the boiler and many a rustic prostrated before it while the train passed before him. In fact, ignorance is in a way, allied to poetic genius; "It gives to airy nothing a local habitation and a name."

The art of music is no exception. Its elusive nature like the will-of-the-wisp has in the East as well as the West given rise to wonderful stories, legends and superstitions which maintain even now the semblance of facts under the aegis of antiquity and which secure a continued lease of life by recognition as well as support extended to them by great scholars whose intention however commendable for sincerity, is most harmful to the cause of the Fine Art.

It is often stated that the art of music is divine. Are not painting, sculpture and poetry so? We ask. Lord Sri Krishna says in the Gita "I am the source of all and from me everything originates" There is

nothing in the universe which does not owe its life to Him. The breath we draw is His gift. To make a special recommendation in favour of music and invoke the aid of Brahman and the Gandharvas as Mrs. Cousins does to support certain fanciful propositions is simply to evade all reasoning and seek shelter behind the cover of equivocal phraseology. There is no secret in music, no mystery. It is a branch of mental science and it is no iconoclasm, as she fears, to subject it to the test of psychological principles. Water is god's gift more useful to the world than music. Do we not decompose it? Who in the name of Vayu, Agni or Varuna calls it profane to resolve it into its ingredients of oxygen and hydrogen! Similarly, it is no sin to examine the art of music, to anatomize it or even to electrolyse it and blow up all its superstitious excrescences if they are hollow and unsound. As Miss Margaret Glyn very clearly puts it,—

> "Many of us are no longer satisfied with the methods of our fathers; we perceive the inadequacy of narrow musical judgments founded solely upon technique. We desire to become artists rather than well-informed mechanics; we are seeking in all directions for an intelligible basis of music that will afford foundation for breadth and independence of artistic criticism. Old fashioned dogmatism will presently be fighting for its life or ceasing to exist. Nature demands survival of the fittest."

In India, the art of music, though in a crude form was long in the custody of the clergy. It was at about Bharata's time, 8th century, that it got into secular hands. Royalty began to patronise it liberally. To win rewards, poets exhausted their legitimate field and

turned their attention elsewhere. Music had freshly emerged into popularity. What if they were unable to compose good music! They could compose verses in praise of the art. A heirarchy of gods and goddesses was called into being to capture the imagination of a people who worshipped the gods of fire, earth, air and water. It is true that in the Vedas, these gods and many more have specific functions and in many cases they as servants of the Almighty, preside over the forces of Nature. Their messages are true even to-day. Great Rishis are their expounders. But the gods said to preside over the musical notes and the ragas have no such duty; nor are they symbolical of anything in the Fine Art. "The Ragas and Raginees," says Miss Margaret Glyn, "are all named after the gods who brought down music from heaven for the solace of man. The varying emotional characteristics associated with each god or goddess are reflected in the Raga....." We wonder if there is any such reflection in the Ragas! There are gods for the *Jatis*, gods for the three gramas, gods for the Ragas and gods for the notes! Their birth-place, complexion, clothing, caste, sex, pedigree, kind of food eaten, their vehicles, etc. are all given with the minutest detail! Such fanciful pictures drawn by persons *who did not know the emotional value of the very first musical note, namely Sa*, is a sufficient proof of the hollowness of the above stories which must have been concocted by a league of musicians, poets and painters.

There are three gramas or scales formed out of the so called 22 sruties. Of these, the Shadja grama is the sweetest and the Gandhara-grama is the most discor-

dant. How selfish and profane too it is for man to reserve for himself two sweet scales and offer the worst to the gods! Again there are two kinds of music,—Margi (Celestial) and Desi (Terrestrial). By confusion all the powers of celestial Ragas are attributed to those of our poor earth. Hanuman caused a stone to melt by singing Raga Gundakriya, but none takes pains to enquire who Hanuman is and whether his Raga is the same as ours. Raga Dipuk is ascribed with the power of kindling fire when sung. There is another Raga which when sung brings down rain. By a proper combination of sounds, music can produce a grand effect upon the ear of the listener as magic; but its influence on the external world is very feeble. The writer had been present at many performances given by the best artists in India. Neither did he see nor hear from any person that at least a single spark of fire or drop of rain fell down at any performance. These powers present possibly in celestial Ragas have been transferred to our Ragas by mistake. Orpheus drew stones and trees by means of music and so did the Pied Piper of Hamelin. We are mortals and our music is quite different. Professor R. Srinivasan draws our attention in this connection to the fact 'Since *Varunajapa* (prayers offered to the god of rain) has the power of bringing rain, music which is also the best adjuster of vibrations must be capable of producing rain.' We are inclined to believe, though strange and even perverse it may seem to some, that the power of music is not so great as that of mere sound which in conjunction with rhythm can create or destroy the worlds. We do believe that a *Japa* or a *mantram* can restore life to a corpse,

because it receives a very strong impulse from the mind. The vibrations of musical notes are confined to the physical plane and can operate through only a few octaves: but in a *japa* the mind can vibrate through any number of octaves. Telepathy is now acknowledged as a real and practical science. Through sound which is only a vehicle, the mind can even reach such a high pitch as to produce fire or electricity. *Yogees* can reduce any one to ashes by their mere gaze. So was Manmatha burnt by the fierce look of Siva. By training the mind by devotion and Bhakti it is possible even for man to raise its vibrations so high as to resonate in unison with the Almighty, raise sympathetic resonance and become one with Him. It is the secret of Yoga and of Tapas. But our musical vibrations stop at the very threshold though they point to the right path. We have waves of heat, of light and of electricity. Of these energies sound is the weakest. Sound-waves in music are therefore incapable of kindling fire or bringing down rain by themselves.

We have now to consider the time of singing Ragas. There are morning Ragas, mid-day Ragas, evening Ragas, season Ragas and so forth. This classification of Ragas according to the time at which they should be sung is another piece of work of fancy of poets of earlier days. We have seen in chapter XI that every Raga expresses a particular emotion and that the particular Raga comes forth reflexively according to the emotion that agitates the heart. When a calamity befalls any one, he will certainly weep irrespective of the time of the day and sing Raga *Varali* but if he should suddenly hear of the acquisition of a fortune, he

would certainly dance with joy and sing a tune like "The jolly good fellow." We cannot do better than quote here a few paras from Mr. Pingale's work on Indian music:—

> "The author sees no necessity for refuting at length the so called theories of Ragas and their specific times, but he challenges any advocate of the belief to explain on any rational basis why out of many instances Todi or Bhupa, Bilahari or Bhupali should be appropriated for the morning or why Multani should be touched only in the *after-noon* or why, again Kalyana should be allotted to the *evening*. It is sheer madness to think that Todi conveys any idea of the morning and when its second note is omitted only in the ascent which is done in the case of Multani, it should convey an idea of the after-noon. It may be added that a similar belief obtains about particular Ragas being only adopted to particular seasons. The above remarks apply equally to the season ragas. Mr. Ramaprasada, in expounding Sankhya yoga says,— "Then again sound has a temperature of its own. The mental impression of sound becomes very often the cause of heat. Indeed, it is well known that music has a warming or cooling effect." The last sentence of the above quotation ought certainly not to shield the superstitious belief above refered to from the ridicule it deserves."

It is probable that this belief originated at a time when music was in its infancy and poetry was its necessary accompaniment. The appreciation of music must have been based upon the meaning of the words which a piece contained than upon the nature of music. Such pieces or poems generally convey a picture of certain events or times so that the Ragas were connected with the *times* even when the words were omitted. Again,

some Ragas are sung in the morning according to the Karnatic while the same Ragas are sung in the evening under the Hindustani system. The fact that even the best musician cannot specify the time at which a Raga should be sung by virtue of its emotion shows that there is no real foundation for the belief other than mere tradition and association. Nor is the division of Ragas as *Sandhi Prakash*, etc, as mentioned in the *Lakshya Sangit* of Vishnu Pandit of Bombay in any way scientific though it is ingenious. It is like prescribing medicines according to their colour and not according to their property.

Another superstition has a hold on the minds of a certain section of musicians in India. Certain Ragas are considered auspicious and therefore sung at the beginning or the end of musical performances. Nati or Kalyani in the South is sung at the beginning and Sri Raga or Surati is sung at the end. This belief is quite at variance with the theory of singing Ragas at particular times of the day. The authors of the belief are often carried away by the literal meaning of the names of the Ragas which if we examine in the light of their emotional significance are neither auspicious nor pleasure-giving. *Kalyani* means auspicious. The Raga cantains F sharp and is therefore a painful Raga. Sri means beneficial, but the Raga contains two painful notes which are far from being pleasant. So is *Ananda Bhairavi*. These beliefs are again due to the ignorance of the psychology of music.

The power of healing diseases lies in music to a certain extent. We found in page 28, that the vibrations of music reach the mind through the nervous

system and from it they extend to the whole body. They plough every cell. A massive feeling suffuses the body. The circulation of blood is regulated. Firstly, a somniferous state is induced. Under its influence, surgical operations may be done, the pain of the operation being less felt. Secondly, when the nervous system is affected with a disease which causes a sluggish movement of the cells, music can set them at work and restore them to a better condition. It is therefore a nervous affection that can be cured. Headache and melancholia yield to the influence of music. General health may also indirectly improve by means of the regulation of the circulatory system; but all these benefits accrue only to persons who are naturally susceptible to the influence of music. Again, in diseases affecting the digestive or respiratory organs, music can produce no good. Its curative property is not only mild but confined to the nervous diseases.

Music is believed to have a great power over the lower animals and plants. Lord Sri Krishna charmed the cows with his flute so much that they stood motionless as in a picture, with mouthfuls of grass half chewn. This is of course *margi* or celestial music with which we have nothing to do. A snake while hearing music nods its head and certain other creatures also respond to the strains of music. A certain writer records the following:—"Mr. Jenner Weir has told me of the case of bull-finch which had been taught to pipe a German Waltz and he was a good performer. When the bird was first introduced into a room where other birds were kept and when he began to sing, all the others consisting of about twenty linnets and canaries

ranged themselves on the nearest side of their cases and listened with the greatest interest to the new performer. Montagu and a few others maintained that in males of song-birds and of many others do not in general search for the female, but on the contrary their business in the spring is to perch on some conspicuous spot breathing out their amorous notes, which by instinct, the female knows and repairs to this spot to choose her mate."

Shakespeare also says:—

> For do but note a wild and wanton herd
> Or race of youthful and untrained colts,
> Fetching mad bounds, bellowing and neighing loud,
> Which is the hot condition of their blood,
> If they but hear perchance a trumpet sound,
> Or any air of music touch their cases
> You shall perceive them make a mutual stand
> Their savage eyes turned into a modest gaze
> By the sweet of power of music,

The effect of music is highly exaggerated in all these cases. Conditions necessary for appreciating music are these,— a fertile nervous constitution, richness of association of ideas, a healthy and well developed sensory organ. We have seen that even among the human beings themselves, there are various grades of susceptibility to music, (See page 174). To some there is no difference between noise and music. They may be very intelligent and possess a wide wordly experience. The failure of the art of music to exert any influence on such people is a sufficient proof that the mere possession of life, intelligence, a nervous system and sensory organs does not enable a man or animal to be moved by music. Rich association of ideas capable of

effecting reflex-actions and move the mind to various feelings is very necessary for musical appreciation. We know full well that animals are not half so sensitive to feelings as we are. Our tastes are different from theirs. The cow, the ass or the deer does not relish our food so much as they do grass which is insipid to us. Of the difference of colour they are not well aware. Of some substances, they do not know the smell. Their dulness to feeling is most noteworthy. Even when a horse is bleeding it runs under the whip of its master; while a human being would, under the same circumstances, have died of pain or shock. A lash on the back of an ox would hardly produce any effect. They have no sense of beauty. Veterinary science tells us that the doses of medicine for animals are quite different from ours. Such being the difference, it does not stand to reason that the delicate vibrations of music so affect the animals as to produce in them feelings of joy and sorrow. They do possess to a limited extent the association of ideas. They recognize familiar faces, voices and localities but they do not know the difference between laughter and weeping. Music in its true sense being the out-powering of the heart-felt feelings through the voice can never be understood or appreciated by the birds or animals. Isolated sounds or even musical notes may attract their attention. When a buffoon caws like a crow or barks like a dog, a number of these beings flock round him. What if a horse starts at the sound of a trumpet? Does not the parrot talk a few words and sentences too like man and distinctly too? Do not certain animals clearly know our words and act according to them. Why not we say that our spoken-language

is intelligible to animals. The cobra or the canary bird may appear to show some fascination for music. Perhaps in their case, an unknown common factor probably softness of nervous matter, exists between man and these creatures as that which exists between man and the rat in attracting the bubonic plague germs. It may be conceded that even with the animals, the law holds good that uniform impressions bring about a feeling of agreeableness. Pat on the back of a dog, a cow or even an elephant, a soothing effect is noticed. A musical note of sufficient loudness must produce some soothing effect, though for want of association, a comic song would sound to them as blank as a tragic one. That is why trumpets and drums have some effect on horses and induce them to march quick or gallop. These facts go to prove that the effect of music on the lower animals is very limited or in other words the notes with which they are pleased do not deserve the name of music in the sense in which it is understood by man.

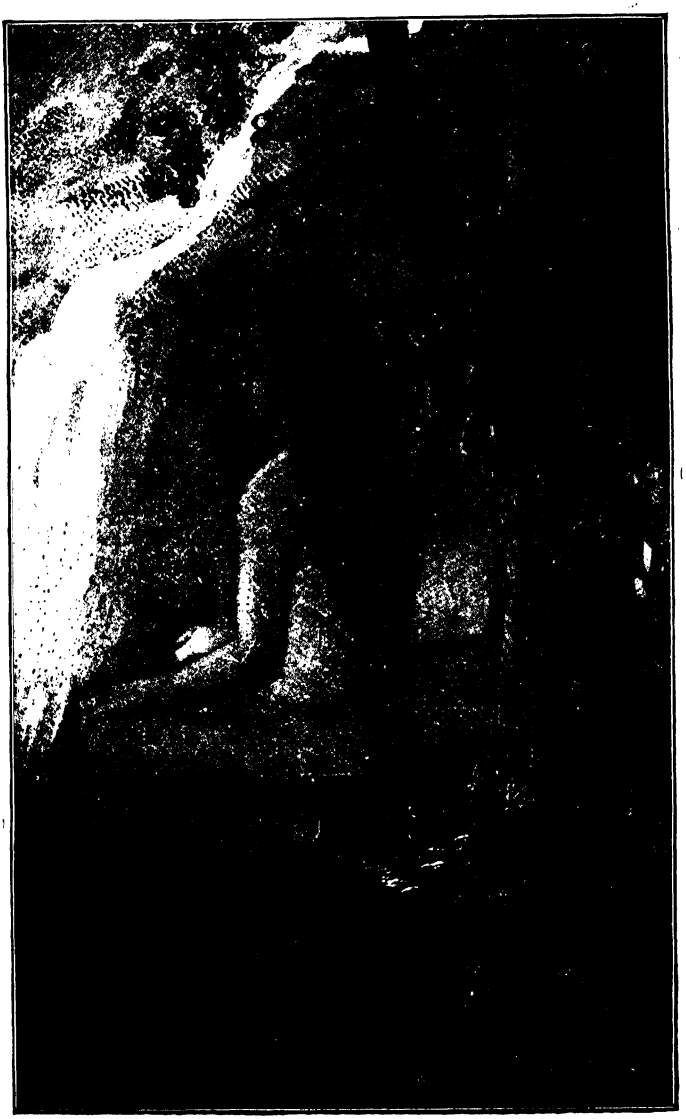
Again, the animal that has a most flexible voice is the dog. Its bark shows all the gradations of emotional sounds. Its wail is equally appealing. If any animal should be moved at all by music it is the dog. But actual experience tells us that a dog is not influenced by music to that degree to which it should be in virtue of the fineness of its vocal expressions. When the present writer played good music near a well-bred terrier, it paid greater attention to the smell of the ghee smeared over the strings of the Veena than to the notes produced on the instrument. Next comes the cat. We often confound its mewing to the cry of tender babes.

Its fighting voice is also ferocious. It does not show even the least signs of being affected with music. The bleating of the goat is the same under pain and pleasure. The cries of several other animals do not disclose to us their mental condition. Such birds and animals cannot the expected to sympathetically respond to the delicate touches of our music and the praise bestowed on the art is too sweeping.

How much less, then, is the effect of the art upon plants. Plants have life, it is true as stated in Hindu philosophy and also as recently proved by Dr. Bose. Mere livingness is of no use for the appreciation of music. Many intelligent men as we have often said have no ear for music. A musician who by old age loses his power of hearing is not influenced by music. How can plants hear or feel our music? Even the touch-me-not which shrinks bashfully at the mere contact of a finger does refuse to respond to the notes of even the highest pitch. There may be different systems of music provided by the Creator separately for animals, plants and even the rocks as for the celestials in the *margi* system; but our business is to show that the music that *we* play and sing has but little effect upon the animal and plant life. Music does not please some men, though their number is small. The European does not like Indian music and the Indian is equally indifferent to the Western art. In India itself, the Hindustani system is not agreeable to the Karnatic and the Karnatic music is like noise to the Panjabi. With so much difference in the appreciation of the art among rational human beings themselves, it is beyond one's imagination to believe that our music can appreciably influence or

move the lower animals, birds, beasts and plants. Here we have a mountain made of a mole.

On the side of the relation of sound and colour, sound and form lies the real mystery of music and its potentialities for opening our vision into realms beyond the known. Possibly, with the help of music, the creation and the destruction of the world as formulated in the Indian philosophy may find strong corroboration at the hands of science. In the year 1785, Chaldini ascertained that the vibrations of plates in the act of giving out musical notes (when set by drawing a violin bow across their edges) caused powder strewn across them to form regular patterns and these have been since known as Chaldini's figures. It is only within the last few years that Professor Sedley Taylor has exhibited by his Phoneidoscope the crispations of a soap film set in vibration by a vocal sound, and still more recently that, by employing elastic membranes, Margaret Watts Hughes through her Eidophone has been able to produce Voice Figures, in which the delicate vibrations of the voice record themselves in several different ways and with remarkably interesting results. 'The first form we get is the floral, especially the daisy. In order to secure the full development of a figure of the daisy class, the note should be repeated diminuendo when the petals will retreat into a central heap, and remain there as long as the note sustained is equal in colour. Some of the most perfect daisy forms are delicately marked on their petals with vein-like lines both straight and curved.' As the learned lady states, "An explanation of these phenomena, and of what, also, may be the chemical and electrical action which, under the



Prince Dhruva meditates upon the Almighty.

He is in union with Him in the state of intellectual repose representing the higher Sa, the octave.

See page 58.

influence of voice-vibrations can thus control matter, suggests a very wide area of investigation."

CONCLUSION

1. Every sound—musical or not—has its own meaning; and every musical note expresses an elementary feeling; Sa expresses repose and the higher notes indicate the feelings specified in the figure on page 58.

2. Every Raga expresses a mood and Sankarabharana represents the happy vital mood. Ri and Dha flats make it melancholy, Ga and Ni flats make it sorrowful and Ma sharp painful. Moods vary according to the notes and the elements of grace, timbre and rhythm also bring about an apparent change in the nature of the mood.

3. Therefore, Raga Kalyani is painful; Todi is pensive and sorrowful; Kharaharapriya is sad; Bhairavi is sad with a tinge of relief; Malavagaula is melancholy and so on.

4. Indian music is the perfect form of Melody. It is devoid of Harmony as understood in the West.

5. The form of Western music is unnatural. Its ideal of Melody as well as Harmony is arbitrary. The sound-element has completely eclipsed the sense-element.

6. The device of modulation in Western music is very ingenious and artistic. The use of concords and discords is, in spite of their psychological anomalies, productive of very grand effects when a combination of different feelings, motions of objects or forces of Nature have to be analogically expressed.

7. Emotions require specific names. As in Medicine, Botany or Geology, it is absolutely necessary to invent Latin terms expressive of the genus as well as the species of every emotion.

N. B.— Most musicians have overlooked the difference between aesthetic and real feelings; they speak of the effects of music as sweet, grand or brilliant instead of sad, merry or melancholy.

ERRATA

The author regrets that a large number of mistakes shown in the following list has crept into the book quite unexpectedly. He requests the readers to excuse him for the inconvenience caused to them thereby and hopes to rectify the errors in the next edition.

PAGE	FOR	READ
15	attempts	attempt
36	temparament	temperament
42	preponderating	preponderates
45	appercieve	apperceive
96	F flat	F sharp
101	Ganya	Janya
108	artibutes	attributes
110	baffoon	buffoon
119	phenomena	phenomenon
131	artifical	artificial
134	fourth	forth
140	expressin	expression
149	absorped	absorbed
155	agreeble	agreeable
157	anamoly	anomaly
166	one'e	one's
169	muscels	muscles
170	developes	develops
176	empression	impression

The musical facts recorded in these pages will, with slight difference of opinion on minor matters, be one day or other accepted by the whole world. The author is therefore willing to explain (as best as he can) any point that may seem obscure or unintelligible in the treatise.