

# Istar

# newsletter



*Nr 2 – April to June 1984*

INTERNATIONAL SOCIETY FOR  
TRADITIONAL ARTS RESEARCH

*113, Jor Bagh,  
New Delhi 110 013*

## EDITORIAL

Most foreigners have escaped from the excruciating Delhi heat, but ISTAR is still going strong. With satisfaction we look back at a year of bustling activities. Bernard Bel's MMA, a microscope for monodic music, is working at full power and Jim Arnold is busy analysing the fabulous melodic patterns of Ustad Asad Ali Khan's subtle rudra vina. Peter Mueller has recorded, catalogued and transcribed hundreds of dhrupads. He has moved to Darbhanga and is working closely with the greatest living Dhrupad master, Pandit Ram Chatur Malik. Jim Kippen has developed new methods for the study of traditional drumming languages, in collaboration with Bernard Bel. Jim has left Lucknow and is now completing his Ph D thesis at Queen's University, Belfast. Pandit D.C. VEDI and Joep Bor have systematically explored the raga system and documented the melodic outlines of major Hindustani ragas. In collaboration with Issaro Mott they have developed a new and 'readable' notation system.

For many centuries Delhi has been a cosmopolitan centre of music, and we have communicated here with many important people in the field. Nazir A. Jairazbhoy has 'mixed feelings' about our activities, but Joan L. Erdman has inspired us tremendously. Premlata Sharma has frequently given us excellent advice. We are happy that more performers and more scholars are joining our venture. Shahab Sarmadee and Sandy Greig will prepare a translation of Rag Darpan, a very important Persian book on 16th and 17th Centuries Indian music. Anne-Marie Gaston will document the music of the renowned pakhawaj master Purushottam Das. Joep Bor will pursue an old hobby: recording and interviewing old unknown sarangi players.

Very successful was the concert of Louis Soret and Anello Capuano (in January), who performed Arabic and Medieval European music on no less than 40 instruments, leaving the audience baffled with their versatility. This concert was sponsored by ISTAR, SCPS and Alliance Francaise. In March, ISTAR took an active part in the Dhrupad Samaroha (festival) in Vrindaban, organised annually by the Sri Caitanya Prema Sansthana (SCPS). In August, Srivatsa Goswami represented ISTAR at the 27th conference of the International Council for Traditional Music (ICTM) in New York.

To ensure a long-term preservation of recorded data, and its accessibility to other scholars, ISTAR has decided to store master tapes with the Archives and Research Centre for Ethnomusicology in Delhi (ARCE).

We are grateful to the Ford Foundation and the National Centre for the Performing Arts of Bombay.

Without their support our dream would never have materialised.

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MAIL

Thank you very much for your bulletin (ISTAR). We appreciate your work in the field of traditional arts research. Can we subscribe it for the future?

Jukka Miettinen  
Associate Expert for Culture  
UNESCO (Asia/Pacific), Bangkok

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Je vous remercie très vivement de m'avoir envoyé les "Newsletters" de l'ISTAR. Je vois avec un grand plaisir que vous avancez dans vos recherches, et que vous n'êtes pas seul... J'ai lu les articles: j'espère que vous trouverez auprès des responsables concernés des oreilles attentives et des aides matérielles suffisantes pour pouvoir développer vos recherches en un domaine où les "racontars", souvent diffusés par des gens incompétents, font légions...

Emile Leipp  
Laboratoire d'Acoustique  
Université Paris VI

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I was delighted to know that you have established ISTAR which is affiliated with NCPA and the work you are doing is presently carried out under the collaboration between the ISTAR and the NCPA.

Vijay K. Kichlu, Director,  
Sangeet Research Academy  
Calcutta

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I appreciate your remembering my interest in the ISTAR NEWSLETTER and look forward to receiving copies of the January 1984 issue that you indicated are now enroute to me.

Frank Joseph Shulman  
University of Maryland Libraries  
Maryland, USA

As soon as I get the Newsletter issue with the latest results of your work, I will sit down with my friends from MusiQuest and see whether the problem of music notation could possibly become a topic of a MusiQuest programme.

Tilmann Waldraff, Director  
Max Mueller Bhavan  
Poona

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It was a great pleasure that I read of ISTAR activities in the two Newsletter issues which you so kindly sent to me.

Timothy Smith  
Patchogue, N.Y.

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Je suis très heureux d'apprendre qu'après les difficultés du début, vous décollez à toute vitesse. Toutes ces activités ont l'air passionnantes et représentent une très riche expérience. Je vous souhaite très fort un vif succès.

Roger Dumoulin  
Paris

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It was certainly interesting to see what you are doing. Many thanks for showing us.

Robert & Lois Gottlieb  
San Francisco

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I would like to receive your publication on exchange basis with the Indian and World ARTS & CRAFTS monthly magazine.

M.R. Dinesh, Chief Editor  
New Delhi

ISTAR NEWSLETTER

Published by the International Society for Traditional Arts Research  
113, Jor Bagh, New Delhi 110 003

Co-editors: Bernard Bel & Joep Bor

## MY NAME IS GAUHAR JAN

by Joep Bor

Listening to the old 78 rpm gramophone records of Gauhar Jan one is transported to another time and another world. An oriental world of grandeur and refinement, of leisure and decadence, of passion and longing. A world in which the courts and saloons of courtesans (*tawaif*) were the main centres of performing arts. It was a fascinating and colourful world in which thousands of female dancers and singers played a vital role. A world which throughout Indian history had always been an integral part of urban life and still flourished in the first decades of this century. A romantic world which now belongs to the past and has almost been forgotten.

And so has Gauhar Jan, the most famous, the most charismatic and perhaps the wealthiest female artist at the turn of the century. A woman who performed all over India and made thousands of people forget themselves. Gauhar Jan is a legend but rarely mentioned in books on Indian music and dance. Who was Gauhar Jan?

Miss Gauhar is of Eurasian descent being born in 1875 in Allahabad as the only issue of Mr William Robert Yeoward, late Engineer of a leading shipping firm of Calcutta, and Miss Allen Victoria Hemming as a result of their marriage three years hence. To the child was performed the baptism ceremony in the M.E.Church, Allahabad in 1875. Owing to certain causes of misunderstanding between husband and wife in 1879, they were separated by divorce and the mother with her child of four years was left to seek means of sustaining herself and her child. For two years she with great difficulty managed to keep up the soul and body together in Azamghat and disgusted with the city life she repaired to Benares in 1881. Here, under strong influence of her protegee, she with her daughter became a convert to Islam assuming the name MALKA JAN for herself and that of GAUHAR JAN for the daughter. As a source of livelihood she learnt singing under Kaloo Oustad and Ali Baksh the dancer of Lucknow. Great credit is due to the man who put into her head the idea of the cultivation of these fine arts. Her innate genius developed marvellously and this was perceivable in her progress by leaps and bounds. Her anxiety was gone and she was pressed for engagements; and she became conscious of her own powers, and knowing as she did Calcutta, she thought that it is a better place for the recognition of her talents and merits. But for the ordained will that Miss Gauhar should develop into a first rate artist she would not have been surrounded by such healthy environments. Gauhar was slowly imbibing musical taste. The tutors were specially interested in the child, having come to understand the stuff she is made of. They were able to foresee that this girl was destined one day or the other to make a mark in the world. Miss Gauhar's first public appearance was before His Highness The Maharaja of Dharbunga in 1887, when she had scarcely completed her twelfth year. His Highness being himself a good artist appreciated her song and dance and her success ever since is assured. She possesses intelligence and this she has cultivated to a sufficient degree and in this lies her secret of success. Possessing a head of good black hair, a strikingly intellectual forehead, magnificent lustrous eyes, a very pretty magnetic face, she is an exquisitely moulded figure of medium height. She has been and is the delight of all visitors of her concerts. (1)

Gauhar Jan became famous in Calcutta and it was there (in 1896) that one of her performances left a deep impression on Abdul Halim Sharar, the well-known writer from Lucknow.

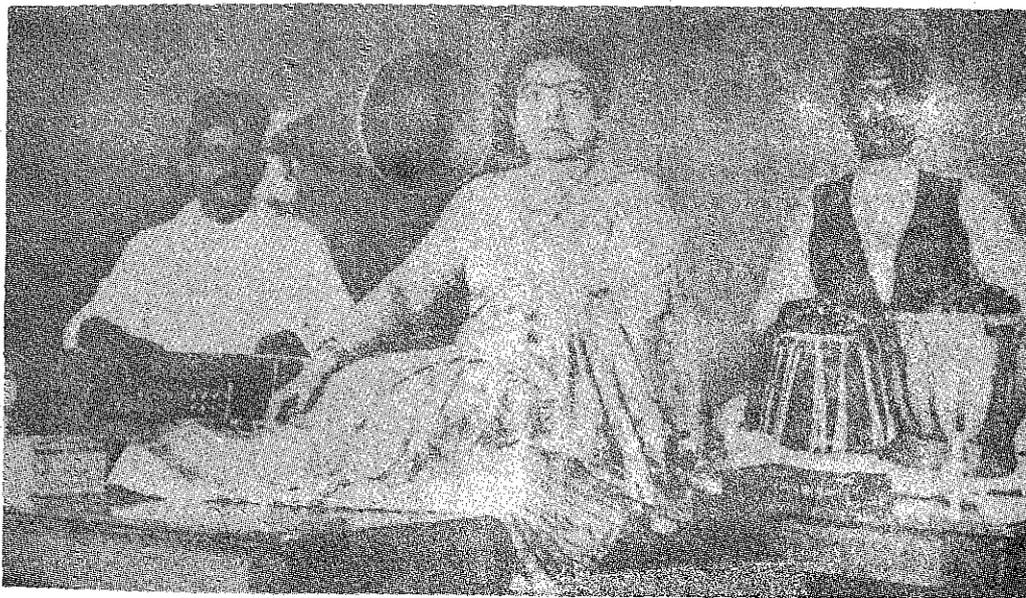
Forty years ago, a celebrated courtesan, Munsarim Wali Gauhar, went to Calcutta and achieved fame. At one performance I witnessed her skill in '*batana*' on the same theme for a full three hours. All those present at the gathering, including the most expert dancers and distinguished people of *Matiya Burj*, were spellbound. There was not even a child who was not impressed by the performance. (2)

The first representative of the Gramophone Company, F.W. Gaisberg, came to Calcutta in 1902 and left an interesting account of his experiences in the entertainment district. About Gauhar Jan he writes that she was

...an Armenian-Jewess who could sing in twenty languages and dialects...Her fee was 300 rupees per evening and she used to make a brave show when she drove at sundown on the Maidan in a fine carriage and pair. Hers were among the six hundred records which proved a firm foundation for our new enterprise...Every time she came to record she amazed us by appearing in a new gown, each one more elaborate than the last. She never wore the same jewels twice. Strikingly effective were her delicate black gauze draperies embroidered with real gold lace, arranged so as to present a tempting view of a bare leg and a naked navel. She was always bien soignée. (3)

However, not everyone was equally impressed by Gauhar Jan. The South Indian editor of the Indian Music Journal, H.P. Krishna Rao, critically reviewed her performance in Bangalore in 1912:

Miss Gauhar entertained the public of Bangalore with her dance and music on the 20th April. The Bowring institute was packed to the full and the entertainment lasted over two hours. The programme consisted of a variety of pieces - Hindustani, Karnatic and English, some of which were sung with style, expression, and beauty. Miss Gauhar possesses a sweet voice which when prolonged seems uniformly grand, more so, as it is produced without any physical strain. The notes are faultless and simple. The gradual transition from one note to another (the linum) and the wave-like ascent and descent (the andolitam) which produces in the mind of the hearer that kind of agreeable illusion which one experience when rocked in a cradle are special points of beauty in her singing. Everything is precise and accurate. Northern Indian dance is a simpler process not involving the more scientific, elaborate and wonderful display of command over the body and the limbs as required in the South Indian system. It consists of a few simple rhythmic movements of the feet and the hands, but Miss Gauhar's gesticulation in which facial expression plays an important part is far above the standard we have observed in Northern Indian dance.



Gauhar Jan in a recording session in Calcutta in the early 1900's.  
From F.W. Gaisberg, "The Music Goes Round".

But we failed to notice in her rendering any of those intelligent flourishes of Hindustani music that we are accustomed to find in first-rate Gavois. The pieces she sang, though suited to the middle class of hearers, were not adorned with any skilful improvisations which an expert cannot possibly avoid even in ordinary singing... Miss Gauhar is known through the Gramophone records even to the villager. Her records are enjoyable but there is a disparity between the copy and the original leading to disappointment. She has made a name and fortune far above the reach of even masters in the art, of whom there are plenty in India and if the key to such success is to be sought for, it will be found to lie in the invisible and effective self-advertisement through the Gramophone:  
"MY NAME IS GAUHAR JAN." (4)

Pt. D.C. Vedi who heard Gauhar Jan in Amritsar and Bombay during the early part of this century, shares to a certain extent the same opinion. He agrees (and who could not agree ?) that she had a marvellous voice. But as a khayal singer she was average and did not follow any established style. He remembers also that when Gauhar Jan was invited by Maharaja Bhupinder Singh of Patiala, she was accompanied by the great sarangi player Ustad Mamman Khan.

According to D.C. Vedi she served subsequently in the courts of Darbhanga and Rampur. She left Rampur in disgust, however, when she discovered that all the diamonds in her jewels (which were kept with the Nawab's treasurer) had been replaced by worthless imitation stones. After this tragic event Gauhar Jan moved to Bombay and was appointed as a courtmusician in Mysore. There she died in 1930.

1. Anonymous: "The Stage Lover" (no date), cited in My name is Gauhar Jan, "The Indian Music Journal", II (1): Mysore 1912.
2. Sharar (A.H.): "Lucknow, the Last Phase of an Oriental Culture", transl. and edit. E.S. Harcourt & F. Hussain: London 1975.
3. Gaisberg (F.W.): "The Music Goes Round": New York 1942.  
-> Thanks to Daniel M. Neuman for sending me a Xerox copy of this interesting passage.
4. Krishna Rao (H.P.): My name is Gauhar Jan, "The Indian Music Journal", II (1): Mysore 1912.

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### MEMBERSHIP

You are invited to become a REGULAR MEMBER of ISTAR if you are actively involved in the practice, teaching or research of traditional arts.

Regular members have the right to vote in the General Body meetings, will be invited to participate in seminars, and will receive a Newsletter three or four times a year. The annual fee for Regular Membership is Rs.100/- in India or the equivalent of U.S. \$ 10.

Name:

Profession/School/University:

Mailing address:

City and pincode:

State/Country

Date:

Signature:

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MUSICAL ACOUSTICS:  
BEYOND LEVY'S 'INTONATION OF INDIAN MUSIC' (1)

by Bernard Bel

ISTAR/NCPA Project #1

Although many musicologists have speculated about the melodic foundations of North Indian classical music (scales, microtones and melodic patterns), most of the work done so far consists of academic interpretations of early sanskrit treatises on music. Very few scholars have taken the risk of investigating the subject with the support of musical acoustics methods. As Mark Levy points out, they "prefer instead to formulate complex theoretical systems describing intonation which are based solely on mathematical-acoustical models." (page 85)(1)

Empirical studies on Indian music started in the early XXth Century. Early experiments were done by measuring the vibrating length of the string of a monochord, or generating microtonal scales on tunable keyboard instruments (shruti harmoniums). Clements and Deval (2) thus identified the system of 22 shrutis (microintervals) as a derivation of the 'just-intonation' system (a division of the octave achieved by combining perfect fifths and harmonic major thirds). Alain Daniélou (3) used similar methods to check his theory based on the 'psychological properties' of the numbers 2, 3 and 5. Later, experiments using electronic equipment were conducted, among others, by B.C. Deva (4), N.A. Jairazbhoy (5), and Mark Levy. These three authors were the first to publish laboratory data and information about their experimental procedures.

One should not condemn too much the apparent absence of scientific interest of the early researchers. On one hand, the equipment and the methods used by Deva, Jairazbhoy and Levy were not much more reliable those of Clements, Deval and Daniélou. On the other hand, the latter musicologists may have benefitted from a closer association with great musicians (and even perhaps from a better understanding of music) than scholars working with commercial recordings or in artificial laboratory conditions.

### ELECTRONIC SHRUTI HARMONIUMS

In 1980, at the Maison de l'Unesco in Paris, Alain Daniélou demonstrated his 'S52', an electronic shruti-harmonium built by Kudelski (Switzerland) to generate the 52 microtones of his theory. I felt that the audience was not quite convinced when he played notes which have never been - and hopefully will never be - used in North Indian raga music... Two months earlier, Jim Arnold and I had demonstrated another shruti harmonium in the laboratory of Mechanics, Paris VI University, and later in the Musée de l'Homme of Paris. Unlike Kudelski's S52, my shruti harmonium is digitally programmable so that any imaginable scale can be generated with an accuracy better than one 'cent' (1/1200 of an octave).

We thought that a programmable shruti harmonium would help us to get a clear idea of the musical scales used by Indian musicians. We soon came to know that the subject is tough. Certainly, most musicians assured us that they would be able to demonstrate shrutis on this instrument, and indeed they tried. We could thus verify that their concept of intonation (based on samvad - or perfect fifth consonance) is close to the system of just intonation - as Clements, Deval, and partly Daniélou had concluded. But there were noticeable deviations in the case of certain notes which play a crucial role in the expression of a raga. Partly because of the presence of a tonic drone (the tanpura), and because of artificial experimental conditions (a fixed-tone instrument), our ideas proved to be too simplistic (6). Most musicians would feel nervous about such experiments and would start playing their own instrument or singing... It was obvious that one cannot extract the tonal skeleton of raga music without 'killing' it!



## STUDYING THE ACTUAL PERFORMANCE

The most recent empirical work on raga performance is that of Mark Levy, a student of N.A. Jairazbhoy, who 'measured' the intonation of several musicians using a closed-loop tape recorder so that a short segment of music can be repeated indefinitely while its frequency is being measured (7). Levy's conclusions came in support of the opinion that shrutis do not exist as individual measurable entities in the actual musical performance, and that the intonation of a particular note is not only strongly bound to its melodic context but also to a great extent left to the incidental interpretation of the musician. In other words, the intonation of raga music is very flexible and does not conform to any system, even though musicians and musicologists may believe so...

Anybody who has had a thorough training in Indian music would be surprised to read such conclusions supported by so elementary experimental techniques... Levy himself admitted that no conclusion should be considered definitive in view of the small quantity of data he could process, and he hoped that "increased access to advances in electronic and computer technology would greatly facilitate the compilation of much greater body of additional data, so that more meaningful generalisations could be formulated..." (p. 142) (8) My point is not to defend advanced technology as a universal panacea. I would rather like to show the disproportion between the seriousness of the issue and a lack of methodology in collecting and processing data: If North Indian musicians claim to achieve a great accuracy in intonation, and to follow certain systematic rules, indeed the scientific approach to the phenomenon should consider these claims seriously. Not only a very large quantity of data must be analysed, but also the musicologist should sit with each musician in order to understand his particular concept of intonation. There is a great difference between the ideal which a musician is trying to achieve through his daily practice, his actual performance, and the way he perceives what he does... What is the actual relevant work for a researcher? To prove that musicians' practice goes against their theories, or to be able to reveal their concepts of perfection, and the psychology of sound perception in a particular musical system? In other words, which of these two approaches may serve music creation and education in the future? I believe, the second one.

I am surprised that Levy's methodology was criticised only on musicological aspects (9), but not on musical-acoustics grounds, which are in my opinion its weakest points. Knowing that notes are rarely steady in Indian music, and that visually they are shown as elaborated curves, how can one assume that one particular segment of the curve should represent that particular note? Indeed, averaging inconsistent measurements could lead only to the conclusion that intonation is 'flexible'! It puzzled me to read (page 89) that "reliable measurements could be obtained only for notes of at least (approximately) 0.5 seconds' duration", and to discover, in Appendix D, curves of melodic patterns for which a sampling time of no more than 0.05 seconds would have been needed... In fact those curves were drawn with much artistic care, if not scientific rigour, to connect a few peaks, the positions of which had been guessed, rather than measured with a reliable system. This explains why Example 1 (Amir Khan) shows an oscillation ending with an infinite slope jumping to a 'blue' note, and why Ustads Nazakat & Salamat Ali Khan (Examples 6 & 9) would repeatedly produce oscillations with the same infinite slopes, having probably found their way out of the constraints of inertia...

## NEW TOOLS, NEW METHODS

When I saw Levy's work, I was completing the construction of the Melodic Movement Analyser (MMA1), which would give pictures and measurements of melodic lines with a sampling time of 0.05 sec or less, and with an accuracy better than one cent (1/1200 of one octave) (10).



Arnold (right) and Bel (left) demonstrating shrutis at the East-West Music Encounter, Bombay, 1983

With the help of the MMA, all the pitch information of a piece of music can be stored with the accuracy of digital measurements (better than one cent). The storage is achieved by a special digital technique on one track of the tape recorder, while the other track has the (conventional) sound recording. The speed of the tape is only 9.5 cm/sec although 10,000 bits/sec can be stored and retrieved with great reliability. Thus a large quantity of data can be stored and processed, giving access to a real wide focus research. Moreover, we generally transfer the data to computer disks to reduce the access time to any section of the performance.

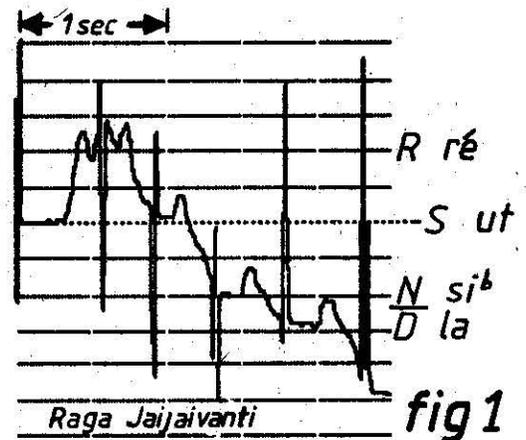


fig 1

In November 1982 the MMA1 was ready and we started examining melodic lines. Later we decided to work with Ustad Asad Ali Khan, who plays the Rudra vina. Rudra vina, as pointed out by Sharangadeva in Sangita RatanaKara (XIIIth Century), is the best instrument to demonstrate shrutis and melodic patterns in general. An example of melodic pattern is given in fig #1. Although the curves delineating the notes Re, Sa, Ni and Dha are remarkably consistent (each note is held for less than 0.5 second), how can one assume that one particular horizontal segment of each curve is 'the' note itself?

The display shown in fig #1 is not accurate enough to do interesting measurements. It is similar to that of a common melograph. To go beyond that limitation, I have developed a device named 'Viewer', which works like a microscope for music. One can scan each dot of the melodic line while its pitch measurement (in cents) is displayed.

The Viewer reveals new aspects of microtonal intonation which only highly trained ears can perceive. An example is shown in fig #2. On the left part of the graph, the note Sa is approximately 2 cents. On the right part, after the pluck, it is raised to 8 cents. Such a difference is meaningful, as it creates a state of 'tension' when perceived by the ear. Similar cases can be observed in other sections of raga Darbari Kanada. This may be the reason why all researchers who have worked with 'blind machines' have complained that "even the note Sa is not stable". Before we conclude that musicians play out of tune, we should try to interpret these deviations of the base note.

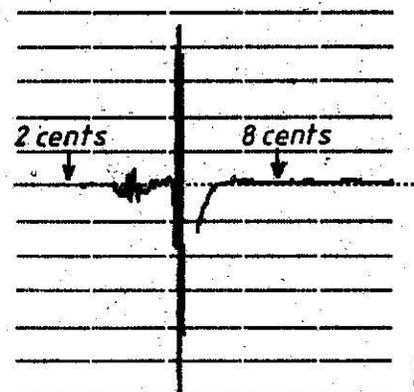
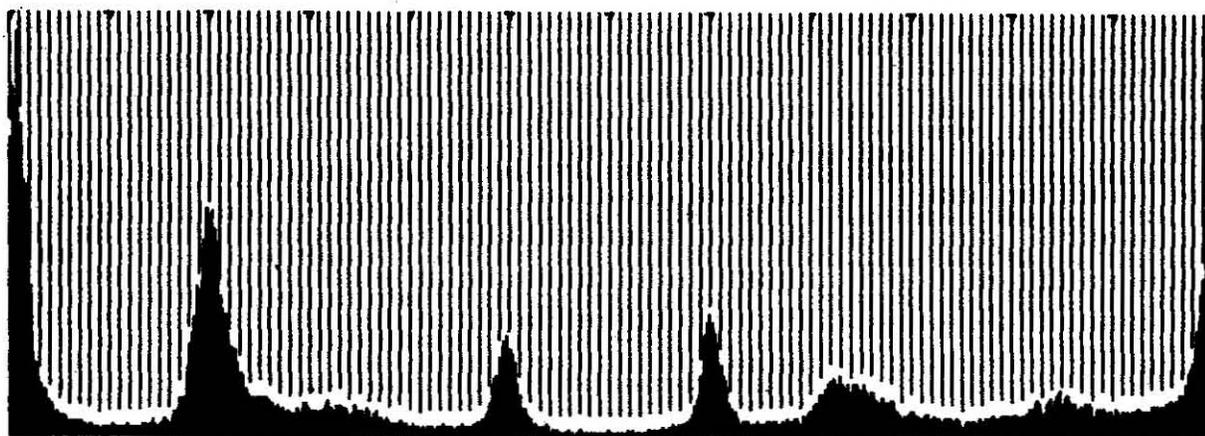


fig 2

How can one determine a scale if there are several base notes? Which is the central one? In fact, examining melodic lines with so much accuracy is like studying the proportions of the Taj Mahal with a magnifying glass... First of all, the ear averages pitch perceptions so that melodic lines appear smoother to hear than to see. But also the brain performs a process of 'integration' of those perceptions which has a tremendous effect on the global 'feeling' of tonality. If geometry is not to be found under the magnifying glass, perhaps one should walk back a few hundred meters and watch the building in its totality. The computer software 'Tonagram' just does this. Following an idea proposed by Messrs Emile Leipp and Tran Van Khe (11), I designed a program which draws a picture of the tonal diagram of a raga over a whole performance (from a few seconds to a few hours...). Each time a note is 'heard' by the MMA1, a counter representing its value (in cents) is incremented by one unit. The 1200 values of the counters can be displayed on a graph which represents the tonal spectrum of the melody. Below is the tonagram of raga Darbari Kanada played by Ustad Asad Ali Khan on the Rudra vina. Each vertical line corresponds to 10 cents.

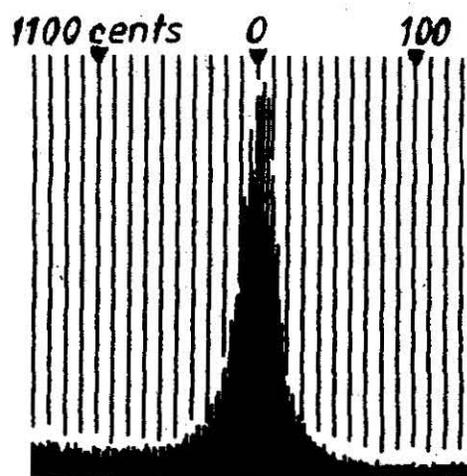


S      R    [G]      M      P      D      N      S  
 ut      ré   [mi<sup>b</sup>]      fa      sol      la<sup>b</sup>      si<sup>b</sup>      ut

**RAGA DARBARI KANADA**

Fig #3 shows a magnification of the region concerning the note Sa. Mainly the curve looks like a Gaussean distribution, with about four thin peaks which represent four different Sa, respectively 1195, 0, 4, and 8 cents. The computer calculates averages and standard deviations for any section of the spectrum, and this has been used to determine the central value of Sa.

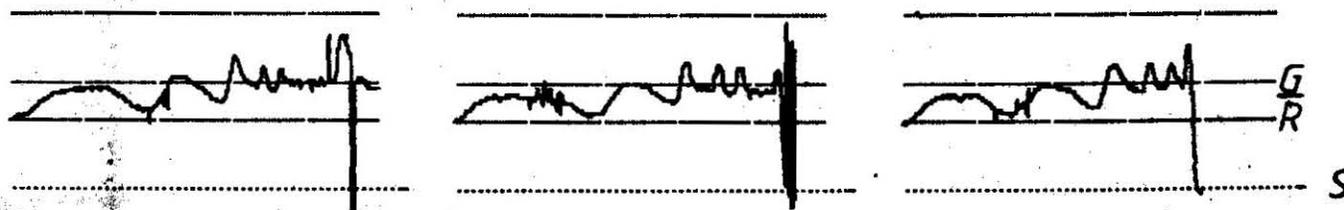
Tonagrams prove that a 'tonal skeleton', a scale, does exist behind the somewhat fluctuent reality of ragas. They also prove that scale theories need to be revised... Take the example of Darbari Kanada: it is generally believed that the notes Ma and Pa should be in perfect consonance (fourth and fifth) with Sa. The tonagram shows that Ma is about 3 cents lower than expected, and Pa 6 cents lower. Re (199 cents) belongs to the equal-tempered scale. Ga Komal does not exist as a note, but as a tonal space equally distributed between 250 and 350 cents. Similarly, Dha Komal and Ni Komal, which are always played as andolit (oscillating) notes, are not clearly defined. With the magnification it is possible to observe thin peaks above the curve relative to Dha, suggesting that certain positions play a crucial role.



<= -140 CENTS, UP TO 139 CENTS

fig 3

MMA experiments on Asad Ali's Rudra vina have shown impressive consistency in the use of microtones and in the shapes of melodic movements themselves. Below are three examples of andolit Ga Komal at different moments of the performance. Each of these movements is of 4 sec. duration.



## NOTATION OF MELODIC LINES

On the following page we are showing a computerised transcription of sections of raga Darbari Kanada played by Ustad Asad Ali Khan. The score in a revised Sargam notation system (devised by Joep Bor and J. David Mott) has been notated by hand below the pictures. The background lines correspond to the following positions: 0, 199, 300, 495, 696, 801, 825, 858, 1020 and 1045 cents. The 300 cent line does not belong to the scale; it is only used as a marker.

## OTHER RESEARCH PERSPECTIVES

So far we have been experimenting with long-stringed instruments (sitar, Rudra vina, Sarasvati vina) and flutes. A new type of fundamental pitch extractor is under construction at the National Centre for Performing Arts, Bombay. It will be used for analysing other instruments, vocal music, and hopefully old recordings.

We expect that such methods will establish a bridge between researchers and musicians. I have always cherished the concept of "transparency of the technique". I do not believe that musicians who are dragged to a modern laboratory with huge computers and many flashing lights will play 'naturally'... In addition, it is very important to produce laboratory results under a format which any musicologist can use as a base of dialogue with the musician. When Ustad Asad Ali first saw the transcription of his alaps on paper, he exclaimed: "this is the best system of notation for my music!" He probably would have reacted in a different way if confronted with pages of numeric tables and other hieroglyphic symbols...

Once MMA data has been collected, the real work on intonation starts: melodic patterns, as all human creations, are in no way simple. There is a certain degree of repeatedness in the overall shapes, which needs to be analysed carefully. Indeed the melodic lines can be divided into elementary patterns or 'phonemes'. But each individual pattern is related to the whole as well. There are certainly several levels of 'semantic' description, from the overall idea of the raga to its stylistic details. How is one going to deal with such a complexity?

To answer this, two major tools are under development in our laboratory. One is a system of morphologic analysis of melodic patterns. Segments of melody can be stored in 'melodic files', from which they will be displayed and analysed following certain algorithms. The aim is to define a minimum set of descriptive parameters for each elementary shape. The second is a computer system which allows the manipulation of linguistic concepts. For the time being, such concepts are being tried for the description of rhythmic patterns, but they may be applied to the description of melodic patterns as well. ■

- (1) Levy (Mark): "Intonation in North Indian Music - A Select Comparison of Theories with Contemporary Practice": Biblia Impex, New Delhi 1982
- (2) Clements (Ernest): "Introduction to the Study of Indian Music": Kitab Mahal, Allahabad 1912
- (3) Daniélou (Alain): "Northern Indian Music": Frederick A. Praeger, London 1969
- (4) Deva (Bigamudre Chaitanya): "The Music of India: A Scientific Study": Munshiram & Manoharlal, Delhi 1981
- (5) Jairazbhoy (Nazir Ali), and Stone (A.W.): "Intonation in Present-Day North Indian Classical Music": Bulletin of the School of Oriental and African Studies 26, 1963
- (6) Arnold (James) and Bel (Bernard): "A Scientific Study of North Indian Music: report to the I.F.P.C. (UNESCO)": Quarterly Journal of the National Centre for the Performing Arts, Bombay: No 2-3, 1983
- (7) I was surprised to read Levy's statement that the "Tape Loop Repeater was devised by Jairazbhoy", as this invention has been used for the segmentation of speech and music, at least since the late twenties, and constitutes in fact the basis of a very well-known instrument: the sonograph!
- (8) In the early sixties already, sonographs were used to transcribe melodies. Later came various melographs used for the study of speech intonation. These machines would have been much more appropriate for this kind of study. I am further surprised that in the richest nation of the world no institution could afford to appoint an 'electronician' for the construction of a melograph for melodic music...
- (9) In the Quarterly Journal of the NCPA (No 4, December 1983), Ashok D. Ranade writes: "In the final analysis, Levy impresses more in method than in substance, in rigour rather than in comprehensiveness. One hopes for a continuation of laboratory-based methodical analysis, but with a definite feeling that this is possible only after a closer acquaintance with Indian musical reality is achieved."
- (10) In other words, the MMA collects as much data in 5 seconds as Levy did in his whole study (about 1200 individual measurements).
- (11) Leipp (Emile): "La Machine à Ecouter" (page 182): Masson, Paris 1977



# East DANCE ENCOUNTER West

The East-West Dance Encounter took place in January 1984 at the National Centre for the Performing Arts (NCPA) in Bombay. It was sponsored by the NCPA, the Max Mueller Bhavan (German Cultural Centre), the Alliance Francaise (French Cultural Centre), the British Council and the Sangeet Natak Akademi. We are presenting extracts of the introduction by the organisers: Georg Lechner, Director of Max Mueller Bhavan, and Jamshed J. Bhabha, Trustee-in-charge of the NCPA.

About thirty dancers and choreographers of different countries participated in the debates, lecture-demonstrations, and public performances in the Tata Theatre. It would be a difficult task to summarise the extreme variety of opinions and reactions from dancers and observers, reflecting the diversity of cultures and experiences. We prefer to present a point of view strongly supporting the idea of research in the traditional arts, even though this idea remained more or less marginal to the Encounter. A student of both Western and Eastern dances (she studied classical ballet and later turned to Isadora Duncan's style and to north-Indian Kathak), Andréine Bel emphasizes the value of 'traditions', not from the point of view of preserving 'frozen' expressional forms, but by exposing the idea of a fundamental 'natural' aesthetic system which underlies many traditional arts of different cultures.

## THE INDIAN SCENE

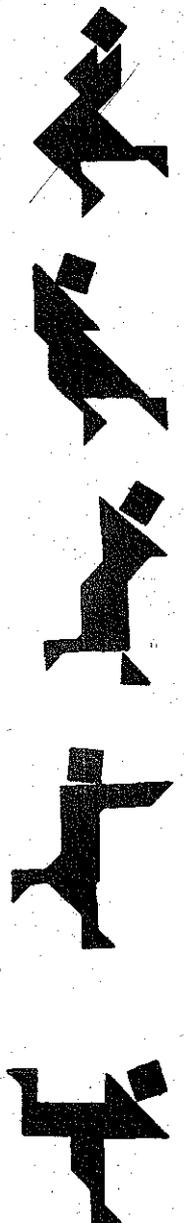
This century has borne witness to two very diverse developments in the realm of dance, in the context of Europe followed by America on one hand and India on the other.

In India, dance as codified in the "Natya Shastra" has been - together with music - an integral part of the theatre tradition, a tradition which harks back to the time of the Vedas. Indian tradition has always associated the deepest philosophical and religious connotations with dance. (...)

Indian classical dance suffered a set back as a result of British colonialism. The temple dances, the forerunner of today's classical Indian dance, were forbidden by law till well into the 30's by the 'Devadasi Act'. The revival of the ancient dance tradition, however, soon became part of the new process of cultural identity, which in the post-independence period brought about the renaissance of Indian classical dance, lasting up to the present day. Ram Gopal, Rukmini Devi, Balasaraswati, Shambhu Maharaj were the pioneers in this task. Comparisons with classical music can be drawn here, too. If the dancers of the first generation belonging to this period perceived their art exclusively as an authentic projection of the traditional dance schools, a certain openness to innovations, no doubt an inevitable result of the contact with the West, is discernible among the dancers of the present generation.

Such attempts at innovations, cautious and tentative as they are, are conceivable for many only within the precincts of the traditional form, to the extent of redeeming from oblivion earlier, forgotten and distorted dance elements; only very few venture forth into the realm of dialogue between eastern and western dance forms (...)

In future too, Indian dance will essentially mean an authentic projection of its traditional dance style. It will at the same time not only be open to innovations but also further develop the dialogue forms that are as yet incipient. The western influence on Indian classical dance, as minimal as it may be, is generally underestimated, but this influence concerns, at a more fundamental level, the concept of secularism and at a more surface level the stage presentation of the dances.



## THE WESTERN SCENE

Since the turn of the century, dance in the West has undergone a revolutionary change, whose essential goal has been to free itself from rigid conventionalism and to achieve a personalised and individualised experience, gained through the whole gamut of body language (...)

The long trail from the free dance of Isadora Duncan to today's post-modern dance led time and again to the fringes of expressional ability of the body and attempted on one side to leap over the boundaries of Dance into Theatre à la Pina Bausch or to orient itself to non-European dance. This was true for Pawlowa and Martha Graham as also later for the Jazz dance or Maurice Béjart and Mudra International. This development in western dance signified at the same time a disassociation from the religious moorings, which for Indian dance is so important even today. (...)

I therefore believe that it is indeed very important for our world today to let two currents, two movements forge ahead: one that our world is one great unity and the other separatist movement through which we have to emphasise the unique value of the individuality of the human being - expressed through his language and other elements that build his heritage and culture. To maintain a balance between these two currents is, I believe, the most important task of our time. (Ballet International, No.6/7, June/July '82). (...)

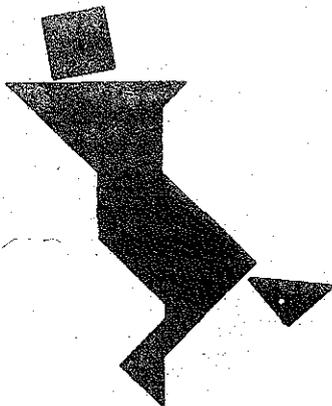
## AIMS OF THE EAST-WEST ENCOUNTER:

The proposed Dance Encounter will not declaim - either extolling or condemning - pre-conceived opinions on East-West synthesis, but try to create a forum for a meeting of minds and exchange of information, where the respective artistic basic concepts, dance styles and work modes as pertaining to India and the West will be analysed in depth. Dance, like music, is replete with examples of how influences from other cultures were and still are artistically recreated and assimilated in many different ways. (...)

To sum up: Inspiration not through theoretical but practical information that could place the revised adage "Cuius regio eius ars" in a new context. At the focal point of this inquiry may well be aggression, melancholy and experiment on the side of modern western dance; stagnation, authenticity and intuition on the side of Indian dance.

Jamshed J.Bhabha

Georg Lechner



## EAST-WEST DANCE ENCOUNTER: DID ISADORA DUNCAN HAVE THE ANSWERS ?

by Andréine Bel

Bombay, January 1984

### ABSTRACT

The Encounter between dancers of different nationalities raised many questions. On the one hand, many crucial questions were left unanswered, and on the other hand, many answers revealed contradictions in the concepts of both the Western and Eastern approach.

Even though Eastern and Western dancers belong to the same human family, there are deep differences both in the forms and in the essence of each culture's dance. Indeed, this variety is a valuable cultural resource. Confronting two cultures may bring out positive changes and new ideas if certain conditions are fulfilled: sufficient time for a fusion (e.g. ancient Kathak gave birth to flamenco through several generations of cultural interactions), or a deep mutual understanding of the fundamentals of each style. But we were far from fulfilling such conditions during the Encounter, and as a result we listened to many aberrant statements as 'conclusions'...

I feel that these statements are the outcome of the unidirectional way such an Encounter was conceived. Most of the Encounter consisted of debates in which intellectual concepts were prevailing over the actual exchange of experience. This article is an attempt to outline certain ideas which might have been emerged if all of us had been willing to investigate the subject in real depth (even if this involved self-criticism).

### A FEW UNANSWERED QUESTIONS

1. What is freedom in art? Neither following tradition, it was said, nor doing anything at random... Freedom consists in 'breaking forms'. Once forms are broken, what happens? New forms are established. And then?

2. What can be considered as 'new'? Is it just something that others don't do nowadays, or does creation demand a deeper involvement of the artist in which this concept of 'new for the sake of new' is just irrelevant? Much of the actual motivation to participate in the Encounter was to collect information about what is done by other dancers and in other countries, and thus lay out a basis for 'new' creation!

3. Is it to be backward to consider dance as a way to reach the harmony with universal elements, a concept common to all old traditions? Such a question was apparently so much out of context that it even aroused suspicion because the Encounter was deliberately focusing on modern (and Western) ideas free of 'old fashioned religious prejudices...'.

4. Is there an instinctive feeling of a 'right' movement (as 'accurate intonation' in music)? Yes, according to Indian dancers. No answer from Western dancers (proving that Isadora Duncan's concepts, if not her name, have been well forgotten).

### CONTRADICTIONS EXPRESSED BY INDIAN DANCERS

All Indian dancers recognised the richness and the depth of their tradition; yet some of them also shared their feeling of frustration for what they called 'a lack of freedom' to express themselves in that frame. They think that tradition, in the way it was passed over to them, equals overcomplication, fossilisation, mummification; that dancers in India are taught to be imitators of their gurus, looking only for individual perfectionism and infallibility. The only way to create, according to them, is first to break the limitations of tradition - to various degrees for each dancer: dance should be adapted to modern times, as it is done in the West. Therefore they try to follow specifically Western patterns of creation, using elements drawn from their traditional background.

For some of them, all 'stories of Gods' should be replaced with abstract themes dealing with modern ideas. For others, group choreography should be introduced into the traditional performance. The third element of renovation lies in adopting Western techniques of movement and the training discipline developed in the West.

Religious stories are known to represent universal (and abstract) themes deeply rooted in the culture of India. Their power as archetypes of human thought is acknowledged everywhere, so that even Western philosophers need to refer to them because of the insufficiency of their own concepts. There is always a risk in trying to abstract the 'essence' of a story, to reduce its scope and make it understandable only through the channel of intellect. If sensitivity is also an important element of the language of dance, then dramatic elements - the frame of a 'story' - need to be re-introduced in one way or the other...

As to group choreography, a dancer pointed out that they were part of the traditional repertoire long ago. Therefore it is probably more valuable to look for creative ideas in the roots of the actual tradition in order to preserve their fundamentals, than to try and imitate Western techniques which follow an utterly different concept of dance. When confronted with that problem, Isadora Duncan investigated the principles of Greek Drama, which she considered as being the root of Western culture. Why not look for such things in ancient Indian Drama?

Similarly there is a complete opposition and incompatibility between traditional Eastern and contemporary Western concepts of movement. Western dancers are following contemporary aesthetic ideas and creating movements which reflect today's life in its mechanisation, anguish, violence, absurdity and boredom... By expressing his personal feelings the dancer intends to draw a picture of the world. Traditional arts, on the other hand, are based on the assumption that there exists a universal logic of aesthetics found in Nature, which is not bound to a certain period of time, and which does not interfere with individual expression. Dancers have precisely to forget their ego and vibrate in harmony with the Universal Soul.

I do not mean that East and West are two closed worlds which will never communicate. On the contrary, they have been interacting for centuries, in spite of and through their opposite concepts. But opposites do not merge into fusion so easily just because it has become an intellectual fashion to expect them to do so! Besides, whenever intercultural fusions were achieved in the past, it was never deliberately planned. It was rather the result of the work of exceptional pioneers who would have developed their awareness far enough to embrace the sensibilities of several cultural forms. In a similar way, there are a few dancers today who have reconciled East and West although they would never proclaim it! For their only concern is art and authenticity, not 'new things' and their intellectual justifications.

Still, in my own view the most absurd dream of Indian dancers is their attraction to the discipline of training of Western dancers! The extremely hard training of a ballerina looks more serious, at first sight, than the somehow unstrained practice of a *shishya* (disciple) who seems to behave as if he had the whole eternity to complete his study... It is a typical Western belief that seriousness means effort, efficiency and standardisation. Only modern dancers have started realising the need to respect the individual.



The traditional 'talim' (teaching) gives a priority to self and mutual respect. Knowledge is not automatically due to the student after that he has paid his fees; he rather has to prove he deserves receiving it. There is a deep psychological wisdom in such a relation, based on the fact that learning involves a total openness of the mind, even at the subconscious level, which cannot be achieved by ready-made teaching methods. In other words, Indian shoemakers design shoes according to the shape of the feet of their customers, whereas in the West one has to adapt one's feet to the standard products... In the traditional training nothing is forced because human nature, when forced, becomes stiff and thus loses 90 % of its potential.

Great traditional teachers have an instinctive understanding of human nature in its totality. This is what makes them great, not their repertoire. Their teaching preserves the integrity of the dancer as a human being and does not merely focus certain isolated aspects of technique or personality. This is why time and patience are so much needed...

It is significant that Western performers reach the top of their stage career around the age of 30, whereas in India it is believed that the maturity of a performer is achieved only around 45, which is also the peak of psychological maturity. Dance is conceived as part of life and not simply bound to the ability to stretch one's legs!

In brief, if changes are necessary Indian dancers have to understand the ideals of their own tradition first. On the other hand, Western dancers would gain much in investigating these concepts which have the potential to revolutionise the whole system of Western values. Do they wish to do so?

#### A FEW STRANGE STATEMENTS...

Failing to answer essential questions, both Indian and Western dancers were led to suggest the most unexpected solutions to the problems met by some participants:

(to a young Indian classical dancer): "If you don't feel happy with your tradition although you recognise its valuable basis, then just drop it and search for another style (preferably Western and modern)!"

If new creations do not receive the expected support from the press, "dance and music critics should be properly educated, as they are in USA, by special schools..."

One Indian modern dancer was demonstrating new exercises and new movements taught in his school. As I asked him why these were not part of the traditional training in India, and why the Indian tradition rejects certain possibilities of movement and training, following rigid rules, he answered that, in his opinion, "it is only due to the blindness and narrow-mindedness of tradition..."

It is a cliché to state that great traditional masters are unable to innovate, installed in the self-satisfaction of their knowledge. Precisely, one recognises such a master through his extreme awareness of the foundations and possibilities of his art, and a clear understanding of the laws of creation. Moreover, a real master is one who has a fast and infallible discernment, so that he is basically incorruptible and cannot be misled.



# Isadora Duncan

(1878 - 1927) is acknowledged to have initiated modern dance in the West, to such extent that most dancers today claim to follow the path of her genius... Yet, even from her writings ("The Art of the Dance": New York - Theatre Art Books, 1977) one can realise that she would not approve the direction into which dancers are proceeding today. Her approach was totally opposite to both the "classical" and the present "modern" one.

She was in search of intrinsic laws of harmony and of real beauty, so that her dance can be linked to any ancient tradition, in East or West. She found most of her inspiration in contemplating the features of movements shown on ancient Greek pictorial documents, and in the idea of ancient Greek theatre. But she was not trying to imitate or re-create this lost tradition, for her real teacher was Nature.

"(The dancer) is but a link in the chain, and her movement must be one with the great movement which runs through the Universe, and therefore the fountain-head for the art of the dance will be the study of the movements of Nature."

She had answers to the four questions left unanswered during the last Encounter:

1. She conceived that freedom in art is not the search for "new" forms. There is no other freedom than inner freedom, that of a unified consciousness communicating with the Infinite. This state of harmony cannot be reached through mental stress nor with artificial movements...

"These ugly and false positions do not at all express that state of Dionysiac abandon which the dancer must know. True movements, moreover, are not invented; they are discovered - just as in music one does not invent harmonies but only discovers them." (p. 102)

2. She felt that life is renewing itself at every moment. So, every movement born from that source is new and unique. Like the breath of the body or the waves of the sea, it has always been there, and yet it is new. "The Dance - it is the rhythm of all that dies in order to live again; it is the eternal rising of the sun." (p. 99)

3. As to the aim of dance, she said that "... (dance) has for its purpose the expression of the most noble and the most profound feelings of the human soul: those which rise from the gods in us, Apollo, Pan, Bacchus, Aphrodite. The dance must implant in our lives a harmony that is glowing and pulsing. To see in dance only a frivolous or pleasant diversion is to degrade it." (p. 103)

4. What was her conception of a true movement?

"The true dance is an expression of serenity..." (p. 99) "Always the lines of a form truly beautiful suggest movement, even in repose. And always the lines that are truly beautiful in movement suggest repose, even in the swiftest flight. It is this quality of repose in movement that gives to movements their eternal element." (p. 90)

"All movements of the earth follow the lines of wave motion. They are governed by the law of gravitation, by attraction and repulsion, resistance and yielding; it is that which makes up the rhythm of the dance." (p. 78)

"All true dance movements possible to the human body exist primarily in Nature. What is 'true dance' in opposition to what might be called false dance? The true dance is appropriate to the most beautiful human form." (p. 69)



**ISADORA DUNCAN**

**Photograph by Arnold Genthe**

To return to the source is to ask what is dance, what is life ?

As rivers flow to the ocean, every true action aims at the unlimited. The rest is agitation.

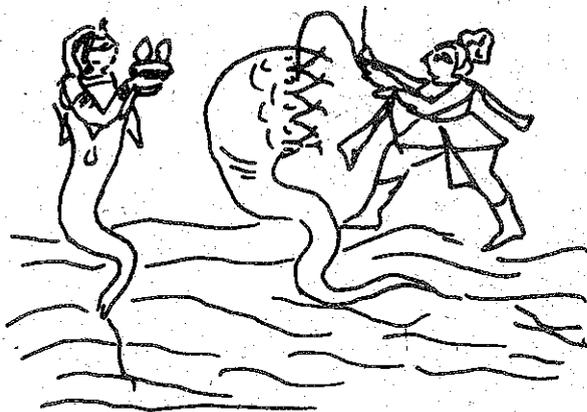
And again I quote Isadora Duncan (1):

"There are (...) three kinds of dancers: first, those who consider dancing as a sort of gymnastic drill, made up of impersonal and graceful arabesques; second, those who, by concentrating their minds, lead the body into the rhythm of a desired emotion, expressing a remembered feeling or experience. And finally, there are those who convert the body into a luminous fluidity, surrendering it to the inspiration of the soul. This third sort of dancer understands that the body, by force of the soul, can in fact be converted to a luminous fluid. The flesh becomes light and transparent, as shown through the X-ray - but with the difference that the human soul is lighter than these rays. When, in its divine power, it completely possesses the body, it converts that into a luminous moving cloud and thus can manifest itself in the whole of its divinity. This is the explanation of the miracle of St Francis walking on the sea. His body no longer weighed like ours, so light had it become through the soul.

"Imagine then a dancer who, after long study, prayer and inspiration, has attained such a degree of understanding that his body is simply the luminous manifestation of his soul; whose body dances in accordance with a music heard inwardly, in an expression of something out of another, a profounder world. This is the truly creative dancer, natural but not imitative, speaking in movement out of himself and out of something greater than all selves." (p. 52)

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(1) "The Art of the Dance": New York Theatre Art Books, 1977 (third edition)



## RAGA SKETCHES

by Joep Bor

ISTAR/NCPA project #6 is a documentation of the music of Pandit Dilip Chandra Vedi who is 83 and one of the last genuine raga masters of the grant past. Partly our work consists of collecting compositions in various genres and talas, and melodic outlines or sketches of important Hindustani ragas.

What are raga sketches? D.C. Vedi refers to them as mukhya chalans which means literally 'the main way of going'. Before teaching a new raga in its totality he often gives a short introductory sketch, defining the main steps of the raga. In fact a chalan is a very short alap (consisting of a sthayi and antara) revealing the characteristic phrasing of a raga in ascending and descending order. It shows also from which notes one must begin a phrase and on which notes one must end. In other words, good chalans are like scientific abstracts. They do not show all the details of a raga but help the music student to identify its main features.

It is important to remark that the chalans are spontaneously composed and not 'ready made'. Depending on the songs D.C. Vedi has in mind, the sketches of one and the same raga will always vary slightly from one moment to another. This is not surprising. A raga is dynamic and comes fully alive when it is developed slowly in an alap. A chalan on the other hand is only a summary of what the raga really represents. Yet, if we compare different outlines of one raga, the 'Gestalt' is the same.

D.C. Vedi makes a conscious effort to create an image of the raga that is original, aesthetically pleasing and as complete and informative as possible. In a few ascending and descending phrases he is able to show three main aspects of raga performance: how to begin, how to progress and how to end. As such his chalans are little masterpieces reminding us of the raga interpretations of the great ustads of the past. Listening to their 78 rpm records we realise that in less than three minutes they were able to bring out the essence of a raga, and leave an impression which most present-day musicians are not even able to achieve after one hour! Vedi's mastery of raga comes out also when comparing the sketches of closely related, but nevertheless independent ragas. Several of these are now becoming obsolete. In his own words: "If these ragas are not preserved the foundation of Indian music will be no more".

A musician's conception of raga depends largely on his knowledge of compositions, especially dhrupads. "Dhrupad is authority; Khayal is nothing before dhrupad...the raga is in dhrupad". Sometimes it is almost impossible to condense all the ideas hidden in the compositions into one outline. In such instances it takes D.C. Vedi a whole session to compose an outline. It happens frequently that even then he is not satisfied and will compose a new piece during our next session. At other times he decides to compose several outlines in one raga. This is particularly the case in Sindhura, Pilu, Dhanasri, Khamaj, Bharavi, etc., ragas with seven or more notes, which have such a wide scope that they can be rendered in various genres. On several occasions D.C. Vedi stated: "We cannot express a raga only in an outline; there must be compositions also. When several compositions are recorded, the different angles of the raga will become more clear". If we want to do justice to the ragas we shall indeed have to present the melodic outlines with one or more songs.

My suggestion to include the ascending and descending scales was rejected however. In many ragas the scales are similar or almost similar. Defining the raga in terms of an aroha and avaroha is therefore an oversimplification which does harm to the concept of raga. Besides, in a great number of ragas, the scale is vakra ('oblique') and it is simply impossible to show the melodic progression without going into detail. Even in straight ragas where it is theoretically possible, one can give various ascents and descents, all of which are used by performers. In other words, the scale reveals next to nothing about a raga. It is "...the treatment and character of notes (svara prayog) which makes different ragas".

Although it has never been our intention to compile a raga dictionary, an important question remains to be answered. Can one artist possibly know all existing Hindustani ragas and would other musicians agree with his interpretation?

**LAGA TILAK KAMOD**

Melodic Outline  
Ad lib, J=c.96

STHAYI

S = , P N S R G S N P M P N S G R P M - ;

ANTARA

G R G S - ;

R P M - P - D M P - S - ; R G S - ; G R P M - ;

G R G S - ; P N - S - R - N D P - D M P S - P - ;

D M - G R P M - G R G S - ; R G S N - P N S R G S - ;

[1 min. 15 sec.]

**LAGA KALYAN (YAMAN)**

Melodic Outline  
Ad lib, J=c.96

STHAYI

S = ; N R G M P M G - ;

ANTARA

G M D - ; N D P - ;

M D N R - ; G - - R S - ; R N S - N D P - ;

M G - ; G M D - ; N D P - ; D P M G - ;

M G R G - - R S - ; N R ; G = .

[50 sec.]

**LAGA PILU**  
- THUMKI STYLE -

Melodic Outline  
Ad lib. (STHAYI) J=88

S = , P M P N S R G G , R G - - R S S R S ,

S R G R R G M - G M R G S R - ; S N = ;

M P N S , R s r g M M g a p M - G G R G M - G - N S N S - ;

- S G G M G G M P - , P ; - - M P M M P D P D P - M G - ;

- - - S G M P D N N S N - - - d P P D - P M - g m p d i p i - P d i S

(ANTARA)

N N D - P M G - ; G M P D N D - P D N

S N M - N P - S N - R N - N D - P M G - G M P i S

N D - P M P - D - P M G = ; S G M P N - D P M G

- - M P N S - M G R S , S R S N D - M P N S - G M P - ; R -

S S R - R S N N P M G - R S N - S R M P N - - S = ;

P N S R - R S R - N - N D - P M M P D - P - d N N D - P

M M P N - D P M M P D - D P M - G R S N -

- P N S R g r g r g M M M - G - - M P - G R S N S - S =

R - S N - D P D N S R G M - S R P - G - - R N S S =

Raga sketches by Pt D.C. Vedi

Transcriptions by J. Bor & I. Mott

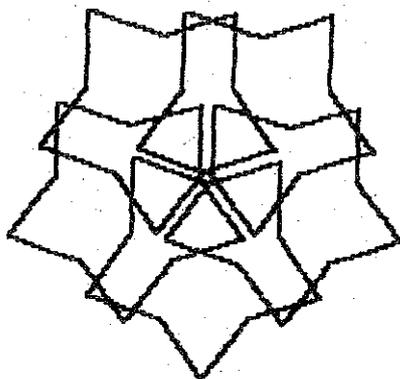
[1 min. 45 sec.]

The answer is simply no. From the west to the east and the north to the south there exist such a great variety of ragas, raga names and interpretations that there is no consensus of opinion even about the approximate number. Some knowledgeable musicians speak about hundreds of ragas, others about thousands! Even artists living in one city, meeting each other regularly at All India Radio or at Conferences and concerts, are bound to hold different views about ragas because they have learnt from different masters in different gharanas.

Many musicians 'possess' or claim to possess a number of rare, complex or mixed ragas which may or may not be recognised by others. Other artists like to experiment with new ragas and only the erudite musicians can judge whether such ragas are real meaningful inventions or just new labels for old products. Moreover, a historical survey reveals that ragas and raga names are ever changing. Ragas like everything else are subject to fashions, to contemporary and local demands.

Yet the situation is not as complex as it appears to be. Musicians with a profound training do generally recognise and respect the raga interpretation of their esteemed colleagues, though they may differ in opinion about details. Such differences are often stylistic, i.e., they can be attributed to the specific way musicians render and develop a particular raga.

Returning to the first part of our question, no sensible musician will ever claim to have a complete knowledge of ragas, even those masters who dedicated their whole life to a study in depth of the raga system. Such masters were and are indeed very few. They were able to acquire such a wealth of raga knowledge by studying from various renowned gurus and gharanas. Unlike musicologists they did not collect it at random. All they know they can also perform. That is the main reason why they are able to compare and judge which ragas are grand, i.e. valuable, balanced and independent, and which ragas are inferior or even meaningless. This is also the reason why, for a true performer, a raga dictionary is nothing but a lifeless compilation of often irrelevant, unconnected and unassimilated data. In D.C. Vedi's words: "If you want to increase the number I will ask this Sangit-monthly to send you 500 aroha-avaroha, but those are not ragas at all". Indeed such compilations, instead of solving the difficult questions about ragas, only lead to more confusion.



JOEP BOR, a sarangi player, botanist and musicologist, grew up in a Dutch family of classical violinists. He studied botany and musicology in the Universities of Amsterdam, Utrecht, Delhi and Banaras, and taught botany at the University of Groningen. Since 1968 he has received sarangi training from Pt. Ram Narayan and various other masters. In 1974 he became a disciple of the renowned scholar-musician Pt. Dr. Dilip Chandra Vedi. He has published many articles on both subjects in international journals and anthologies. He co-authored (with Wim van der Meer) "De Roep van de Kokila" (M. Nijhoff, 1982) and broadcasted series on Indian music on the Dutch and German radios. In 1984 he received a travel grant from the Dutch Ministry of Culture to work with ISTAR.

Itsuo Tsuda (1914-1984) was born into a rich Japanese family. As the elder son he should have taken over the responsibility of managing his father's estate. He preferred instead to break with his family and go wandering in search of free thinking. Having reconciled with his father, he came to France in 1934 and studied sociology with Marcel Granet and Marcel Mauss till 1940. After 1950 he became interested in the culture of his own country, studying Noh theatre recitation with Hosada, Seitai with Noguchi, and Aikido with Ueshiba.



Seitai, namely 'harmony of the posture' is a new understanding of human nature and behaviour. Noguchi, who had studied most traditional healing techniques, had come to the conclusion that none of them, and no combination of them, can assure Man's happiness and development. He realised the extraordinary power and wisdom of the subconscious, a fact which is part of all traditional teaching systems, but which so far had not been investigated in all its aspects. Noguchi further discovered that the regenerative power of the sympathetic system (the part of the nervous system which governs involuntary acts) could be awakened and developed by a simple exercise called 'regenerative movement' (Katsugen-Kai). His ideas and the practise of Katsugen-Kai have been propagated in France and in Spain by Itsuo Tsuda since his return from Japan in 1970.

Itsuo Tsuda has published seven books on this topic (Editions Courier du Livre, Paris). We present an extract of his fourth book "UN", in which he compares Western education with traditional teaching methods.

## EDUCATION OF THE SUBCONSCIOUS

by Itsuo Tsuda

"Children learn high-level mathematics and theories before they become accustomed to simple arithmetic operations; addition, subtraction, multiplication and division", a teacher said to me, "as a consequence when they are teenagers, they still don't know how to do a two-digit operation."

To fill that gap, a new kitchen-scale has been invented, which automatically performs additions. This machine does not yet exist in Japan, because there the practice of reckoning has not yet been lost.

"That boy we saw this morning", a woman says to me, "is hardly ten years old, but he talks like a grown-up. He already looks like a little old man." "Many of my customers have completely lost contact with the real", complains a psychoanalyst.

We have entered an era of increasing abstraction. Civilised man is losing 'sensation', that vital activity which ensures a grasp of the real world. We believe we have closed the door, therefore it 'must' be closed. If it is not, it is not our fault. The explanation should be looked for elsewhere.

This tendency to abstraction may be irreversible, because education today is only concerned with the conscious. The teacher delivers his knowledge the same way a waiter brings a drink to a customer. He has to feed pupils with the official programme. The thing that matters is the programme, not the teacher.

I had the opportunity of experiencing an utterly different kind of education in Japan. I don't mean the official national education system which is structured the same way as in the West. I mean a way of educating pupils which is peculiar to the masters I have known. The peculiarity of that kind of education may be described from different angles.

First of all, not only is this particular education not systematic, but it also refuses systemisation, which puzzles number of people who approach it through intellectual curiosity.

Next, what is important, is that in most cases one does not know what is the practical utility of the teaching, nor what it consists of. This was the case for example when I started learning Noh theatre recitation. I am still unable to explain why I put so much effort into learning something totally useless. However, I must admit it has opened my eyes on a new world, of which I cannot formulate any convincing verbal description. It is the same with Seitai and Aikido.

There was a time when I used to receive telephone calls from unknown people: " - Sir, tell me what your method consists of? Is your discipline useful for this or that? How long does it take to learn it? You are teaching the 'School of Respiration'. My husband is asthmatic. Can you cure him?". I was feeling disgusted. The idea would never occur to me or to anybody to ask such questions on the phone to Master Ueshiba or Master Noguchi in Japan. I had waited long enough before the desire in me became strong and the 'diapason vibrated', and I presented myself at my masters' doors. In Europe, one keeps publishing catalogues for the use of method - pilgrims. These (methods) are wrongly classified by categories: In one kind of case, one asks one person, in another kind of case, one asks another. Thus one has the intellectual satisfaction of possessing a global synthesis of all existing methods, without getting involved oneself.

" - What do you want? Westerners are like that. One has to accept them as such", I was advised. No, I do not agree that all Westerners are so. When the diapason vibrates, there are no Westerners nor Easterners any more. But the diapason does not always vibrate. Everything depends on the individual and on the moment.

One accedes to the teaching of the master through the narrow gate. Often the gate was closed to any new-comer in the old days. One mentions the 'gateless toll-house', 'Mumon Kan' in Zen. To be admitted by the master, people did not hesitate to sit motionless for three days and three nights near the gate, without uttering a sound.

Obviously this is contrary to the principle of modern teaching in which one is admitted provided one has the required qualifications. It is absurd to discourage those who come to learn. One has to be rational.

Rationalism, considered fragmentarily, looks very logical. But it may turn out to be absurd if one considers its global aspect. The teaching of Japanese masters is often full of absurdities which, in fact, are intentional. I try to show the logic of such absurdities.

The most curious, indeed, is the institution of 'uchi-deshi', living-in disciples. These are young students who live in the house of their master, unlike amateurs and living-out pupils. It would be logical to think that these uchi-deshi should have more access to the direct teaching of their master, since they do not have to waste their time in conveyance. The reality is quite different.

At the house of the Noh master, amateurs come for private lessons of recitation or 'shimai' (Noh dance), whereas uchi-deshi have no access to it; all day long they are busy with housework: cleaning, preparing the master's kimono (dress), preparing his bath, etc., and not allowed to attend private lessons. Moreover, they may be severely scolded by the master for not having profited from the lessons which were not taught to them, but to amateurs.

One master of the tea ceremony instructed one of his disciples to clean the garden as guests were expected. The disciple did so, but the master said the cleaning was not satisfactory. The disciple put more effort into it, but again the response of the master was negative. In total despair, he spread flower petals over a corner of the garden. That time the master said 'yes'. Why had he not told him earlier what he wanted? It would have been sufficient then to 'execute the project' and avoid an useless waste of time.

One of Master Ueshiba's uchi-deshi has told me his experience. Whenever at night he feels his master might be about to go to the lavatory, he immediately gets up, adjusts his kimono, and sits properly on his heels. I must explain that in Japanese houses rooms are separated by light sliding doors which one can open on two or three sides of the room to cross it. They are not at all like Western rooms, compartmented with one single door which one has to knock before coming in. Strict intimacy is, therefore, difficult to realise. The door opens and the master comes in. The disciple bows to him with respect. If he does it wrong, he is severely reprimanded. But, if the master has to cross his room at any time of the night without warning, then how does the disciple get time to sleep?

He prepares a bath for his master. The bathing tub is of Japanese old style, that is, a large iron wash-basin. Each time one has to light a fire to warm water. The temperature of the bath must match perfectly the master's desire, but he (the disciple) is not allowed to put his fingers into the water and check whether it is still too cold or warm enough. Logically it would have been sufficient to use a thermometer and the problem would be solved. Why create such difficulty?

Living-in disciples, therefore, are subject to a kind of slavery, to the will of their master. They have to accept without question all his fancies, all his ragging. Such a condition is unthinkable in the civilised West. The pupils would create a syndicate to protest against the injustice of their master, to denounce his lack of rationalism, and to demand improvements in their training conditions. They would demand the master to conform to the official standard programme.

In fact, teaching Japanese arts, e.g. martial arts, in Europe, resembles more the training of civil servants than the breaking-in of slave-pupils as it is practised in Japan.

In Europe, those who have successfully completed the official programme receive a corresponding degree, and reach a privileged position in an administrative structure created just for this. They have the right to remunerations and prerogatives authorised by the central administration.

In Japan I have no right to anything; I have done Aikido just for the pleasure of doing it. There is no promise of remuneration or privilege. On the other hand, if I wish and can afford it, I have the freedom to create my school as I conceive it. I do not have to follow any programme, like a painter who depicts nature in his own style.

The irrational attitude of Japanese masters towards their internal disciples is not explained by the desire to propagate their teaching methodically. Yet it conceals a deep intention.

If action, in the West, is considered as the projection of an intellectual process on the plane of reality, action, for the masters I quoted earlier, is life itself. Any action undertaken without the 'Ki', that intense desire which predisposes us, is bound to fail. What is important is that predisposition, not knowledge.

I have known people who would only establish parallels in whatever I would tell them, just to show me their vast knowledge. If I talk about the 12 human types of Seitai (taiheki) they say that we also have 12 zodiacal signs in the West. That kind of reaction discourages me completely to pursue the dialogue.

Ragging by Japanese masters aims mainly at establishing the real dialogue between master and disciples, a dialogue which is not obstructed with words, a dialogue which allows to transmit the inexpressible, directly, from heart to heart. The master waits until the ice breaks. There are also people who are totally unable to reach it.

One of these Noguchi's disciples was also one of these incapable persons. One of his functions was to bring a cup of tea just at the moment his master had finished his meal. But the latter, having retired in his room at some impossible hour, perhaps one or two o'clock in the morning, used to eat alone, his dinner served on a tray. The disciple was waiting for the proper moment to bring tea, but he could not know what was happening in the room, because it was closed with 'shoji' sliding doors made of opaque paper glued on wooden frames. He used to mobilise all his perception faculties, but he would always come too early or too late. One day he got the idea of piercing the paper with a needle and see what was happening inside. That device did not help him to develop his intuition. He soon renounced the training and left his master.

A few years later Mrs Noguchi met that man in a street. Always obsequious, he told her what had happened after his departure. He had got a job in an estate agency, had made some money, had bought a house, got married and had two children, etc... In brief, he was happy. If one is not predisposed, it is better to look for something else.

In summary, the education of Japanese masters aims at preparing the ground capable of absorbing the teaching, not at the accumulation of knowledge. It is, if you like, the education of the subconscious. Probably this is one reason why the Japanese Ministry of Education gave its support to Noguchi's school. It is still possible in Japan to conceive such an education, because there is a tradition linked to the domain, not of 'to know', but of 'to do'. It is out of the question for this support to become an administrative measure at the national level, because the education of the subconscious is, in any way, a narrow gate.

Among Europeans, whose mentality is differently oriented, it is out of the question to adopt word for word an educational method which is not in their tradition. I write to give them the perspective of a world they have already forgotten. I have reduced practical elements to the strict minimum. One just has to say "breathe in, one, two, three...." It is simple. What happens in reality is much more complex. I advised the participants to try to direct (regenerating movement gatherings) at least once, when I am out, to try what happens then. The reactions I got from the participants are revealing enough. I quote some of them at random:

Group leader A - We heard up to one, two, but not three. I opened my eyes to watch what was happening. 'A' was squatting in a corner, completely doubled up.

Group leader B - He pronounced the words in such a military fashion that we were all feeling bad.

Group leader C - She spoke too fast and we could not follow her. The next time she spoke so slowly that it also failed.

Group leader D - He had such a stiff appearance that everybody burst into laughter. He feels offended and doesn't want to do it again.

Group leader E - That old man was lacking intensity, but his rhythm was correct.

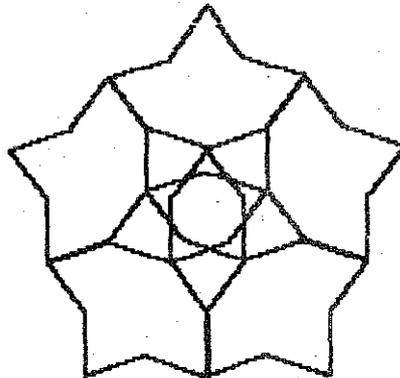
Group leader F - He was awful. I was sick just listening to his voice. I think he has not understood anything of the regenerative movement. He jostled me and I was sick.

One lady told the organisers:

- What is difficult in counting up to three? Anybody can do it.
- You want to try?
- O.K.

That evening, there were a few participants on the tatamis (mat). The organiser told the lady: "Now it's your turn, go ahead!". Suddenly she felt panicked, cried "No, no, no", and collapsed on the floor.

Still there is a small difference between 'to know' and 'to do'. As long as the subconscious is not educated, the easiest thing in the world faces insurmountable difficulties.



LINGUISTIC STUDY OF RHYTHM:  
COMPUTER MODELS OF TABLA LANGUAGE

by Jim Kippen (JK) and Bernard Bel (BB)

ISTAR/NCPA Project #5

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Q - Why do you call your research 'A linguistic analysis of North Indian rhythm'?

JK - Through my knowledge of the tabla, I had begun to understand that the realm of North Indian rhythm could be studied from the point of view of its 'language', in other words, the spoken representations of the strokes of the drum or the movements in dance. I was being taught the art of creative thinking through my lessons, a matter of prime importance in a student's talim, or education. During the process I found I made many mistakes, but I gradually built up the ability to recognise them and create music deemed acceptable by my teacher. In other words, I was following rules, some of which are conceptualised and verbalised, while others are only intuitively felt. It is the difference between "No, you can't have that because it is not in the original vocabulary of the piece" ! and "Well, that doesn't feel right somehow."

From this realisation that there really were rules and that strings of bols (meaning both words and strokes) made sense only if they were subject to them, I decided to pursue a line of enquiry aimed at establishing a 'grammar' for the tabla. The concept is not misguided as both the English word and its Urdu equivalent, 'qavaid', are frequently used by musicians themselves.

Having decided that it was indeed a language with which I was dealing, I needed to establish techniques in order to analyse it. These techniques were derived from principles of mathematical linguistics and automata theory. Hence the title of the project: 'A linguistic analysis....'

Q - What is the aim of the project?

JK - Given the premise that tabla music is a language, and the rules used in composition and improvisation constitute a grammar, the aim is to discover that grammar. In the initial stages of research, it would be a basic grammar for a limited number of compositional types in tabla which could be used, not only to check the 'correctness' of pieces, but also to synthesise new compositions. These could then be screened by musicians and gradually we would be able to build up a grammar which reflected actual musical practice and not only what may be theoretically possible.

Q - You have only mentioned 'a limited number of compositional types in tabla' so far. Why, therefore, do you call your project 'A linguistic analysis of North Indian rhythm'?

JK - It's a general title which reflects an ultimate aim rather than an immediate one. Eventually, we would extend our grammar to the full repertoire of the tabla, to other drums of North India which use related bol patterns, such as pakhawaj, dholak and naqqara, and also to Kathak dance. Other drum and dance languages, not only of India, but anywhere in the world could theoretically be tested using these grammars.

Q - Who are your informants for this research?

JK - It's not always so easy to get musicians to part with their knowledge. Considering the limited amount of time I had in which to collect data, I felt it was important to work with musicians with whom I had already established a good working relationship. I began working with my tabla teacher, Ustad Afaq Husain Khan, the head of the Lucknow gharana, and other members of his family, notably his son, Ilmas Husain Khan. I also received help from Sri Bhupal Ray Choudhuri of Calcutta, a prominent disciple of my teacher's father — the late Ustad Wajid Husain Khan. Thus my data was compatible with that which I had collected in previous research from the Lucknow tabla gharana. For a comparison of styles, I also worked closely with Ustad Inam Ali Khan, the head of the Delhi tabla gharana.

Q - What methods have you used to collect data?

JK - My main method for data collection has been what the social anthropologist calls 'participant observation'. I learned through trial and error to compose and improvise, and thereby imbibe the rules as my lessons progressed. I tried to understand which processes I myself was using to make compositional decisions. In other words, I tried to formalise sets of rules to guide the compositional process. Otherwise, data has been compiled in the following four ways: from written material from my lessons; from transcriptions of spoken and played material from recordings of my informants; from transcriptions of commercially recorded material available, and lastly from published tabla material in Hindi, Urdu and English.

I chose to begin collecting data on a compositional type called qa'ida. Qa'ida constitutes the very basis of composition and improvisation in tabla playing. The word means 'rules' or 'system', and it implies that variations on a basic composition are created using systematic methods such as permutation, substitution and repetition of the original elements. I selected certain key qa'idās on which to work and collected material on them from all my informants, as well as from books and recordings. I also asked the same people on many occasions to give data on the same qa'idās. This proved very interesting as I found some variations to be identical to those created on previous occasions, and others to be quite different each time.

Q - How did you decide to process your data?

JK - In order to test my theory that the music of the tabla is a language, I knew I would have to process an enormous amount of material and develop a method of checking the validity of the various grammatical rules. I was fortunate to have the full cooperation of Bernard, who demonstrated how a micro-computer and a modified form of a word-processor could solve all these problems. Firstly, we had to store the data. We worked out a method for entering tabla material into an Apple II micro-computer using keyboard-correlation system, for example 'Q' equals 'dha' and 'W' equals 'te' etc. Secondly, we had to process the data. Bernard created a programme called 'BoI Processor' which, in the framework of a modified word-processor, contained the grammar. By analysing pieces given by our informants, we could test our grammatical rules. If a variation of a qa'ida did not check out against our grammar, the grammar was unsatisfactory. The grammatical rules were then changed accordingly. Another variation of a qa'ida was entered and the process repeated until we had a satisfactory grammar. We also used the grammar to synthesize new variations which were then examined by our informants. Their comments guided us to still more modifications of the grammar. Now we have a workable grammar for one qa'ida, but obviously we need to apply ourselves to the study of other qa'idās before we can say we fully understand the processes involved in qa'ida improvisation. I say 'workable grammar' and not 'final grammar' because there is room for us to develop it and make it more efficient.

Q - For which qa'ida have you found a workable grammar?

JK - It's the famous Delhi qa'ida which goes:

dhatetedha tetedhadha tetedhage tinakina  
tateteta tetedhadha tetedhage dhinaghina

However, I must make one point very clear: as I was working mainly with Lucknow musicians, I learnt their way of playing this qa'ida which is different from the way in which the Delhi gharana musicians would play it. Therefore our grammar would not apply to the qa'ida in the form I have just demonstrated. The grammar would need modifications before it could work. You could think of this as the differences between dialectal variations of the same language. The qa'ida, as played by the musicians of the Lucknow gharana, for which the grammar was created, goes:

dhatetedha tetedhadha tetedhage dhinaghina  
dhatetedha tetedhadha tetedhage tinakina  
tateteta tetetata tetetake tinakina  
dhatetedha tetedhadha tetedhage dhinaghina

**Q** - How does this grammar work?

JK - The idea has been borrowed from Chomsky's grammars. The overall grammar comprises five smaller grammars. Grammar #1 contains 'starting symbols'. It is called a 'generative' grammar. The other grammars are called 'transformational' grammars and their function is to provide a link between the starting symbols and the 'terminal' symbols which are the tabla bolis themselves. The linking symbols are called 'intermediate' symbols and they represent groups of bolis or building blocks of the sentence.

Here is an example of simple generative grammar:

- (1) S --> S S
- (2) S --> DT
- (3) S --> TD
- (4) DT --> dha te te
- (5) TD --> te te dha

'S' is the starting symbol, 'dha' and 'te' are the terminal symbols (two tabla strokes). 'DT' and 'TD' are intermediate symbols representing the 'chunks' <dhatete> and <tetedha>. If one applies these rules in random order until only terminal symbols are left, one will get a string of 'dha' and 'tete' such as:

dha te te dha te te  
te te dha te te dha dha te te  
dha te te te te dha te te dha dha te te... etc.

This set of five rules is able to generate one type of 'composition'. Therefore we call it a 'language'. Note that, thanks to the recursivity of rule (1), the length of the composition is not limited. Consequently, an infinite number of compositions can be created, and the language is said to be 'infinite'. Unfortunately, this particular example has no real practical value: all tabla pieces are conceived on a time-frame called the 'tala', according to which a certain number of time-units are allotted to the composition - say, 16, 32, 10, etc. Therefore no language in 'tala' is infinite.

The same set of rules constituting a generative grammar can be used for analysing a string of symbols, or a sentence, provided that the right arrows '-->' become left arrows '<--'. In other words, each rule is applied from right to left. Take for example the sentence:

te te dha dha te te dha te te

Here are the successive transformations appearing in analysis (numbers indicate which rule has been applied):

- (5) TD dha te te dha te te
- (4) TD DT dha te te
- (4) TD DT DT
- (3) S DT DT
- (2) S S DT
- (2) S S S
- (1) S S
- (1) S

At the end of the computation, the only symbol left is the starting symbol 'S'. Therefore we say that this sentence belongs to the language. You can easily verify that starting with the following sentence:

dha te te dha dha te te te te dha

the last stage of the computation will produce:

S dha S

and that no further derivation is possible. Therefore this sentence does not belong to the compositional type defined by the grammar.

Q - Is it easy to write such grammars for complex compositional structures as they are found in drumming?

BB - Chomsky grammars are powerful tools because they can apply to the description of the compositional structure from different levels. Each level represents a set of decisions which musicians themselves must take - consciously or not - when improvising. For the 'dhatete' qua'ida we have found that five levels (i.e. one generative and four transformational grammars) are sufficient. In other words, only 31 rules are necessary to generate thousands of pages of variations. One can view these rules as the instructions of a computer program devised for composing any piece at random.

Q - Why are you using linguistic methods based on theories which have not proved very successful for the description of languages? Modern linguistics has developed new concepts today, which might be more powerful...

BB - Certainly Chomsky's models are too restrictive to be used for a description of 'natural languages' like English, German, Chinese, etc. Their main defect is a limitation of the notion of 'context'. In natural languages one has to establish conceptual links between words which may be separated by many other words in a sentence, but the original Chomsky grammars do not allow it. Yet on the other hand these simple mathematical formulations of 'languages' have led to the development of artificial languages, especially languages for computers. Later it has been established - thanks to Turing and others - that each type of language can be associated with a particular automaton, whose work would be to generate or to analyse sentences of the language. Automata theory, today, is a very important part of mathematics on which all new developments in computers, artificial intelligence, etc... are based.

Jim and I had the intuition that Chomsky models would apply to drumming languages, as they are more or less 'mathematical games' with a limited number of terminal symbols. Yet it would have been impossible to write such grammars without the help of the automaton, namely, the computer. Many times you figure out a set of rules which seem perfectly right for certain compositions, and they fail abysmally once you try them on the computer: either your correct pieces are not recognised as correct, or, in synthesis, the computer creates pieces which are obviously nonsense! This is very frustrating in the beginning, but it becomes a fantastic game after some time: you are forced to revise most of your conceptions of tabla grammar, and formulate them in a non-ambiguous way. Gradually you acquire experience both with music and with automata...

Q - This whole process sounds a bit inhuman... Is there any space left for human intelligence and sensitivity in this research?



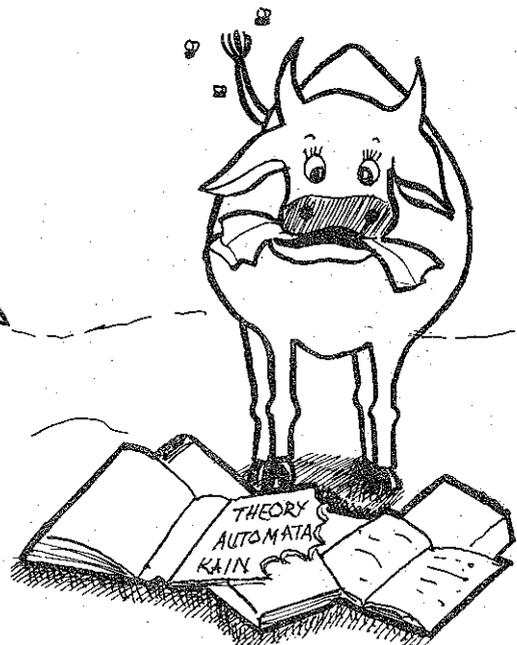
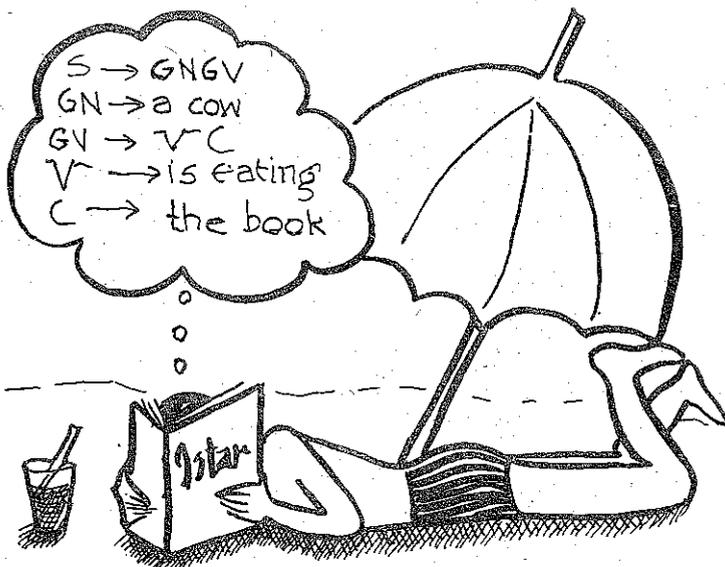
BB - Thirty years back people would scream when hearing that computers can be 'intelligent'. "Machines are just stupid, they cannot think. Computers can only do what you tell them to do", so they used to say... But today everybody has admitted the existence of 'artificial intelligence'. Machines can think, no doubt, and they even outrace humans in taking intelligent decisions. Take the example of Samuel's checker program, which can beat top level players, including Samuel himself! Similarly, the Bol Processor with its 31 lines of instructions knows much more tabla than I would be able to learn in a few years!

We are also proving that machines can display a certain aesthetic sense. Using the basic concepts of automata theory, we can create a grammar which generates all 'correct' pieces. This is what we call a 'minimum grammar'. But among these pieces some may be used very scarcely, although they are grammatically correct, just because they do not sound 'nice'. To account for this, we have found ways to weigh the decisions of the computer, or to follow certain paths of computation which modify the original idea. Such grammars are redundant, but the additional rules are called 'aesthetic rules', and generally they are used only in analysis, or in synthesis.

However one should not think that the aim of this project is to create marvels to replace musicians ! These machines help us to understand the human mind - how musicians create and perceive music. This is very important for developing new methods in music education. Imagine for a moment you want to study German but there is no grammar... As a child, you can do it. But it becomes much more difficult later; you feel that certain rules should be formulated, not because you fancy intellectual games, but simply because you want to learn faster ! Now, apply this same idea to Indian music, which most musicians have learnt from their parents or gurus at an early age, but which they have to teach in universities and schools nowadays. The need for educational methods is badly felt by the new generation of music teachers after the disappearance of the Guru-Shishya (master-disciple) relationship.

Q - How do musicians react to your work ?

JK - Although technology has been harnessed to assist us in this research, it cannot overcome the very basic, human problems involved in setting up a working relationship with the musicians who play the tabla and 'speak' its language. In actual fact it can be a hindrance because there is, mixed with an admiration for technology and the undoubted benefits it can bring, a genuine fear that it will undermine the importance of the musician with his acquired skills and knowledge. I fully realise that a musician can never be replaced by a machine. My wish is that a partnership should be forged between man and machine to allow us to understand much more about music.



- 1 GRAM#1 (1) ORD:
- GRAM#1 (2) V1 --> S1F S2V
- GRAM#1 (3) V2 --> S1V S2F
- GRAM#1 (4) V3 --> S1V S2V
- GRAM#2 (1) RND:
- GRAM#2 (2) S1V --> D D D D D D D D D D B DHINAGHINA
- GRAM#2 (3) S1V --> S1T
- GRAM#2 (4) RIGHT: S1V --> D D D D D D D D D D D D D D D D
- GRAM#2 (5) S1T --> D D D D D D D D D D B DHINA D D
- GRAM#2 (6) S2V --> D D D D D D D D D D B TINAKINA
- GRAM#2 (7) S1T --> A B DHINA D D
- GRAM#2 (8) S1T --> A B D D D D
- GRAM#2 (9) D D B --> D DT B
- GRAM#2 (10) D D B --> DT - B
- GRAM#2 (11) D D B --> TETE B
- GRAM#3 (1) RND:
- GRAM#3 (2) D D D D D D D D D D --> D A (for analysis of siv)
- GRAM#3 (3) D D D D D D D D D D --> A D (ditto)
- GRAM#3 (4) LEFT: D D D --> DT TETE
- GRAM#3 (5) LEFT: D D D --> TETE DT
- GRAM#3 (6) LEFT: D D D --> D TETE
- GRAM#3 (7) LEFT: D D D --> TETE D
- GRAM#3 (8) LEFT: D --> DT
- GRAM#3 (9) D D --> - D (for analysis)
- GRAM#4 (1) RND:
- GRAM#4 (2) DT --> DHA
- GRAM#4 (3) DT DT --> - DT
- GRAM#4 (4) DT DT --> DT -
- GRAM#4 (5) DT DT --> DHA-
- GRAM#4 (6) DT DT --> -DHA
- GRAM#4 (7) DHA DT B --> TETE B
- GRAM#5 (1) ORD:
- GRAM#5 (2) S1F --> A B DHINAGHINA
- GRAM#5 (3) S2F --> A B TINAKINA
- GRAM#5 (4) B --> DHAGE
- GRAM#5 (5) A --> DHATETEDHATETEDHADHATETE

A

Chomsky  
grammar for  
"dhatete"  
ga'ida

(Lucknow style)

(starting symbol)

- DHATETEDHA TETEDHADHA TETEDHAGE DHINAGHINA DHATETEDHA TETEDHADHA TETEDHAGE TINAKINA ← S1F S2F
- TATETETA TETETATA TETETAKE TINAKINA DHATETEDHA TETEDHADHA TETEDHAGE DHINAGHINA
- DHATETEDHA TETEDHADHA TETEDHAGE DHINAGHINA DHATETETE TETETEDHA DHA-DHAGE TINAKINA ← V1
- TATETETA TETETATA TETETAKE TINAKINA TATETETE TETETETA TA-TAKE TINAKINA
- DHATETE -TETEDHA TETEDHAGE DHINAGHINA DHATETEDHA TETEDHADHA TETEDHAGE TINAKINA ← V2
- TATETE -TETETA TETETAKE TINAKINA DHATETEDHA TETEDHADHA TETEDHAGE DHINAGHINA
- DHATETEDHA TETEDHADHA TETEDHAGE DHATETEDHA DHATETEDHA TETEDHADHA TETEDHAGE TINAKINA ← V2
- TATETETA TETETATA TETETAKE TATETETA DHATETEDHA TETEDHADHA TETEDHAGE DHINAGHINA
- TETEDHATE TETETEDHA --DHAGE DHINAGHINA TETEDHA- -DHA-DHA TETEDHAGE TINAKINA ← V3
- TETETATE TETETETA --TAKE TINAKINA TETETA- -TA-TA TETETAKE TINAKINA
- TETEDHA- TETE-- DHA-DHAGE DHINAGHINA -TETEDHA TETE-DHA TETEDHAGE TINAKINA ← V3
- TETETA- TETE-- TA-TAKE TINAKINA -TETETA TETE-TA TETETAKE TINAKINA
- DHA-TE TE-DHADHA DHA-DHAGE DHINA-DHA DHATETEDHA TETEDHADHA TETEDHAGE TINAKINA ← V2
- TA-TE TE-TATA TA-TAKE TINA-TA DHATETEDHA TETEDHADHA TETEDHAGE DHINAGHINA

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