Special Issue

John Blacking and the "Human/Musical Instrument Interface": Two Plucked Lutes from Afghanistan

John Baily

Blacking's theories about music structures and the physical movements in their performance — Baily's experimental work on motor control in pointing at visual targets — ethnomusicological research on playing two Afghan lutes (*dutar* and *rubab*) with radically differing linear and tiered arrays of note positions — learning to perform as an ethnomusicological research technique — how the typical repertoires of the two lute types are related to the spatial distribution of note positions

Blacking's Early Insights

John Blacking had a long-standing interest in what he later came to term "the biology of music making."[1] The roots of this lay in his undergraduate training in anthropology and archaeology at the University of Cambridge. Physical anthropology was an important part of the syllabus. His wife, Zureena Desai, later played an influential role in supporting and informing his interest in the biological aspects of music and dance; she qualified as a doctor in South Africa and was later awarded a PhD in the Faculty of Medicine at Queen's University Belfast.

In two early papers, published in *African Music*, on the Butembo flute and the Nsenga *kalimba* Blacking developed some seminal ideas about the relationship between music structures and the human body. Concerning the Butembo flute, Blacking found that the music was constructed from repeated patterns of fingering, which, coupled with varying degrees of overblowing to obtain upper partials, seemed to generate the melodic sequences of the tunes. He suggested that the shape of the music was influenced by the spatial properties of the instrument (Blacking 1955). In the case of the *kalimba,* he found that:

> The most significant common factors of the kalimba tunes are not their melodic structures, but the recurring patterns of 'fingering' which, combined with different patterns of polyrhythm between the two thumbs, produce a variety of melodies… [The] tunes… are variations on a theme, but the theme is physical and not purely musical. (Blacking 1959: 6)

From these examples came Blacking's idea that certain aspects of music structure are "rooted in the human body." This phrase is actually a very good example of Blacking's ambiguity of expression. Music is obviously "rooted in the body," in the sense that music requires ears to hear, hands and vocal parts to move, and brains to facilitate these processes. But Blacking obviously meant more than that. He was interested in showing how musical structures are shaped by the inter-

1 The term "biology of music making" was borrowed by Blacking from The Biology of Music Making Inc, a group of medical practitioners in the USA with a strong interest in music. The group organised three international conferences. Blacking attended the second of these, held in Denver in 1987, as a member of the panel convened by Helen Myers on Children's Music (Blacking 1990).

European Journal of Musicology | ISSN: 2504-1916
Bern Open Publishing
Vol. 23 | Issue: 1 | DOI: 10.5450/EJM.23.1.2025.137

action between the morphology of a musical instrument and the human body, with its physical structure, physiological control systems, and psychological information-processing capacities.

When I first met Blacking in 1972 I found these to be exciting ideas because they corresponded to certain insights about music-making derived from my own background in experimental psychology.[2]

Responding to Visual Targets

Responding to visual targets, such as reaching for objects or pointing at them, is one of those highly complex actions which we tend to take for granted as part of our coordinated biological make-up, but it is in fact a highly intelligent process. It is part of the way we think in movement, in a “non-ego centred mode of thought,” by which I mean there is no inner voice that verbalises what to do and how to do it. Here we encounter the “thinking body” in the exercise of normal spatially coordinated behaviour. The efficient exercise of this capacity is in itself positively rewarding: skilled action is inherently pleasurable for the performer.

When I first met Blacking I had recently completed a PhD on human spatial perception and motor control. As a graduate student at the University of Sussex I had constructed an elaborate (and rather sinister) apparatus to measure the accuracy of pointing at visual targets when the hand itself could not be seen. The apparatus also allowed one to time the duration of pointing movements, to contrast between fast “ballistic” movements, in which all decisions about the movement are made in advance, and slow “feedback controlled” movements (see Figure 1).

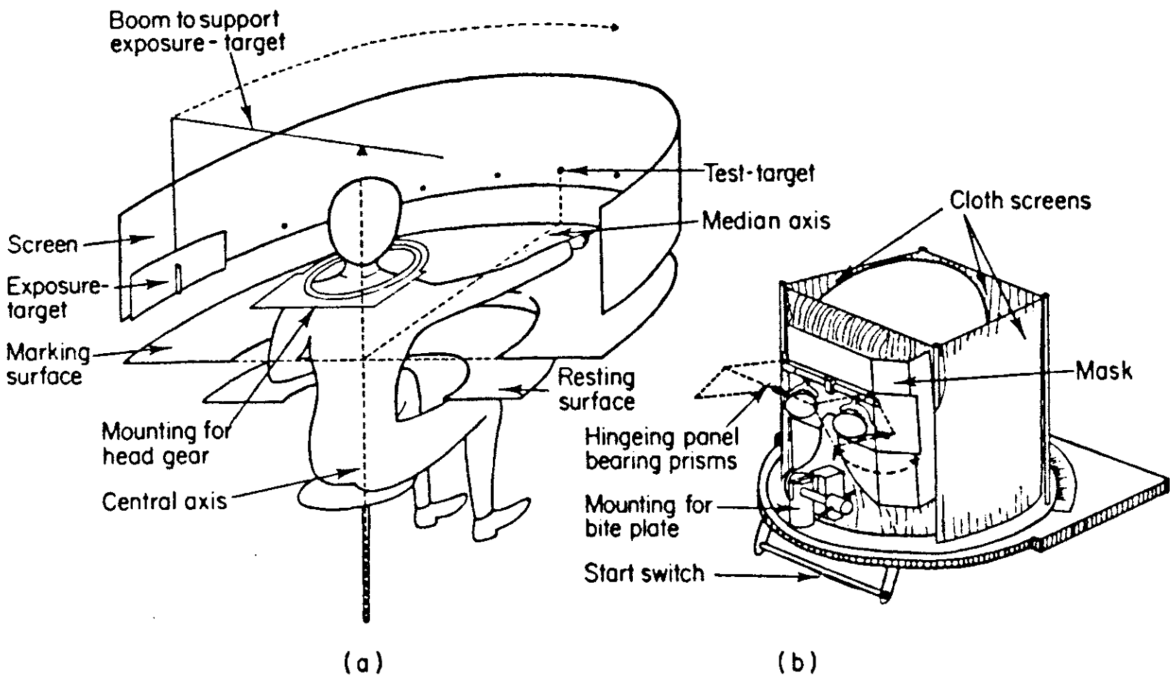

Figure 1. Apparatus for measuring visuo-motor coordination (from Baily 2006: 108).

2 I first met Blacking in Belfast in 1972, soon after he had been appointed to the Chair of Social Anthropology at Queen’s University Belfast. See Baily (1994) for further details.

The apparatus included a motor-driven trolley which allowed a human "subject" (the language is interesting) to point at a target without using the muscles of the arm. Foot switches controlled the left-right movements of the extended arm, and another switch allowed the subject to mark the final position of pointing (see Figure 2).

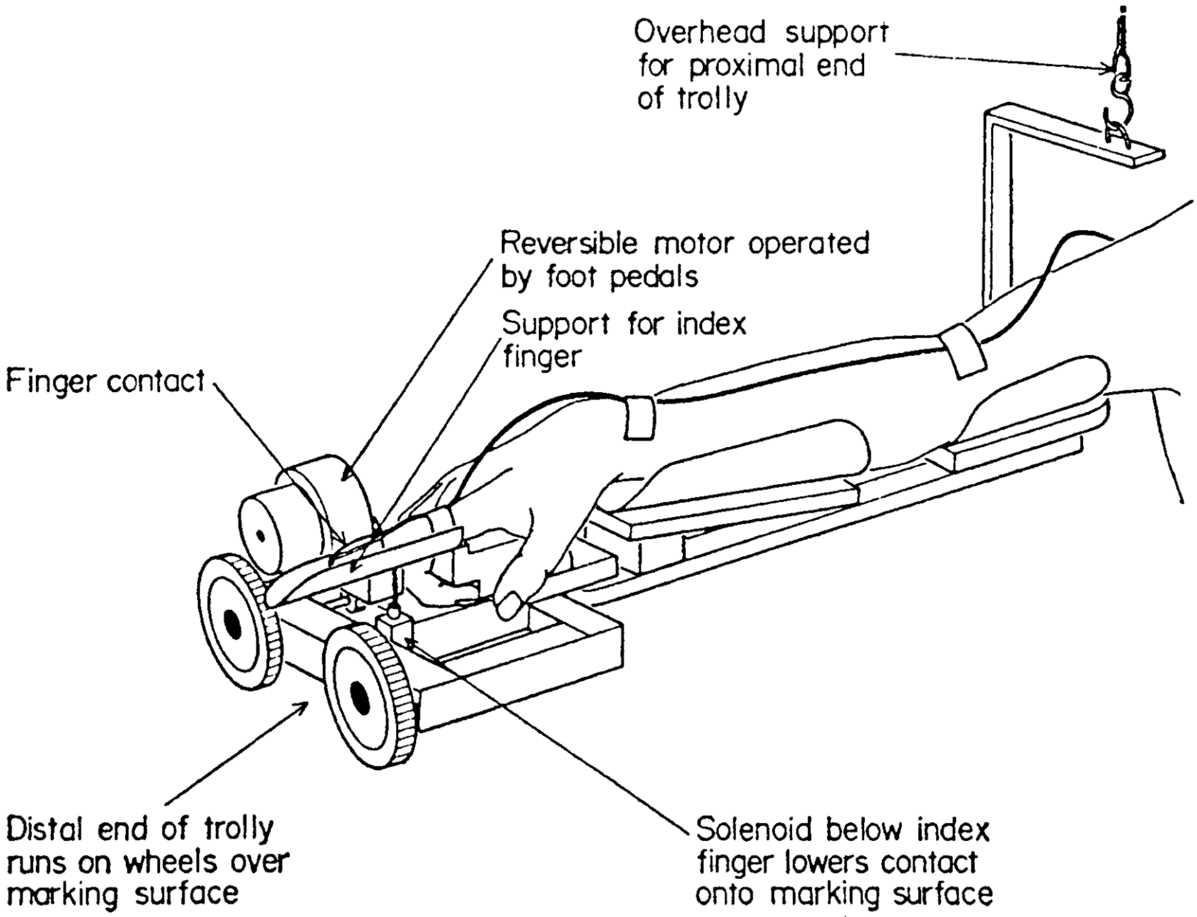

Figure 2. The passive arm mover (from Baily 2006: 109).

My research involved disturbing the normal relationships between movement and visual perception by "transforming the visual input" – having people view their arms through a wedge prism which moved everything visually 15° to one side, so that the arm was seen to be in one place and felt (kinaesthetically) to be somewhere else. Pointing behaviour is initially systematically disturbed in this situation but quickly adapts under the appropriate conditions. When the prism is removed and the transformation ends there is again a disturbance in coordination, but now in the opposite direction (Baily 1972a and b). This sort of research in the 1960s was relevant to early space flight and the issue of human movement under gravity-free conditions. Richard Held at MIT, for example, had argued on the basis of such experiments that human sensorimotor coordination would gradually break down in the absence of gravity. Eventually, he believed, the human sensorimotor system would become totally disorientated and incapable of effective action. These predictions have, of course, proved incorrect. The human capacity to move effectively in the condition of weightlessness is, though, truly remarkable.

"Reading around" my subject in the library of Sussex University I discovered Bruno Nettl's *Theory and Method in Ethnomusicology* (1964) and must have been profoundly influenced by reading Nettl's comments on a passage from Curt Sachs. Sachs had stated:

> The original concepts of vocal and of instrumental music are utterly different. The instrumental impulse is not melody in a "melodious" sense, but an agile movement of the hands which seems to be under the control of a brain center totally different from that which inspires vocal melody.... Quick motion is not merely a means to a musical end but almost an end in itself ... the vocal and the instrumental expressions of a tribe are never one in style. They shape two separate arts. (Sachs 1962: 110)

Nettl commented:

> While we need not accept this theory as applying to all cultures, we must agree that the instrumental and vocal styles of a people often differ greatly. One reason, of course, is the structure of the instruments. *The kinds of things which the human hands can do with an instrument, the kinds of things which random play will emit, may shape the style to a large extent*. (Nettl, 1964: 209, emphasis added)

Nettl's book also directed my attention to Mantle Hood's article "The Challenge of 'Bi-musicality'" which argued that the student of non-Western music should not bypass basic musicianship in the music culture in question, and specifically mentioned acquiring the capacity to hear intervals correctly, and developing memory span in learning pieces aurally. I saw a way of extending my expertise in human sensorimotor coordination into an area in which I had a strong interest as an amateur "folk, jazz, and blues" performer.

After finishing my DPhil I soon had the chance to put these ideas into practice. In 1971 I spent several months in Kathmandu, Nepal, and began, under the tutelage of two young Nepalese graduates of the Bhatkhande College in Lucknow, a practical study of North Indian music which proved invaluable in my later work in Afghanistan. I started to learn to play the *tabla*, and while I never became a very competent *tabla* player, I was fascinated by the learning process itself and how it related to my studies of motor skill. Acquiring this new skill allowed me to experience in a very direct way much of what I had read concerning motor learning, the grouping of initially separate components, programming, attention processes, and routinisation. The *tabla* tutor that I wrote based on this experience (Baily 1974) explained some of these insights, and put forward some innovative ideas about the verbal representations of movement patterns.

The Work with Blacking

This interest in the movement processes underlying musical products was Blacking's and my initial point of contact, and a matter on which we agreed to collaborate. We applied to the Social Science Research Council for funding to look at three types of long-necked lute that I had already observed in Afghanistan: the *dutar*, *dambura*, and *tanbur*. The SSRC turned down the proposal but invited a resubmission. Eventually we were awarded an SSRC Post-Doctoral Research Fellowship for a project entitled "A Cross-cultural Study of Music Skills." According to the abstract of the research application:

> It is proposed to make a cross-cultural study of the music skills involved in playing two types of lute, the Herati dutar and the Irish fiddle. The two music skills will be compared in terms of: (a) the organisation of motor patterns in the playing techniques, (b) the acquisition and transmission of the skill, and (c) the social/cultural structures which support the skill. It is hoped to discover how social and cultural factors act upon "natural" patterns of hand movement and shape the structure of skilled performance.

It is worth reproducing the introductory statement to our proposed investigation because it shows a good deal about the very "scientific" and highly structuralist approach we were adopting to the study of what we called "field skills":

> Man's ability to use his hands in a skilful manner to manipulate the environment and to engage in complex operations is one of his most important capacities, and has been a crucial factor in his physical and cultural evolution. This important area of human behaviour has received a good deal of attention from experimental psychologists and others, who have employed a variety of abstract laboratory tasks to isolate and investigate many of the component processes underlying skilled performance. Man, however, is not a laboratory animal, and the laboratory approach hardly does justice to the complexity and richness of the skilled behaviour which he exhibits in his normal everyday life. We will term such everyday skilled activities field skills.
>
> There are two main features of a field skill. Firstly, at the behavioural level, the skill consists of a basic set of component actions. These make up the motor vocabulary of the skill. The range of possible component actions available to man is large, but the vocabulary of a particular skill consists of a rather limited set drawn from this. Through grouping and sequential ordering, these component actions are elaborated into the motor patterns which are characteristic of the skill. In other words, the component actions of a particular skill are organised into a certain type of structure, which is determined by a set of structural rules. The motor patterns characteristic of the skill are, in a sense, generated from these structural rules. The isolation and definition of its structural rules should be one of the main objectives in the analysis of a field skill.
>
> The second feature of a field skill is that there are a variety of social and cultural factors which impinge upon its performance. These factors determine not only when and where the skilled activity is performed, but how it is performed. They may have a profound effect in shaping the motor patterns which may be observed at the behavioural level. For this reason, the structure of a field skill cannot be fully appreciated without considering its social and cultural environment. The structural rules underlying a field skill will, to some extent, reflect constraints imposed by gross anatomy, neural wiring within the sensorimotor system, and the psychological processes underlying skilled performance, but they will also reflect social and cultural constraints. It is evident that even such basic activities as walking, standing, sitting and reaching are influenced by social and cultural factors. This influence is more obvious when we consider patterns of movement such as gestures and facial expressions which serve a communicative function. It is difficult to discover what man's "natural" patterns of movement are until these social and cultural influences on body movement and posture have been estimated.
>
> At present, we can only guess at the impact of social and cultural processes on complex manipulative skills. This problem calls for a cross-cultural study of elaborate and highly structured field skills, in which we try to relate inter-cultural variations in skilled performance with processes in the social/cultural environments. This is the general orientation of the research proposed here. (Blacking and Baily 1973: 9–10)

The grant application went on to argue that music provides a very profitable area for the study of the organisation of motor patterns in skilled manipulative behaviour and outlined one of the key elements of our approach, which was to look at the relationships between the morphology of a musical instrument, the motor patterns which characterise its performance technique, and the structure of the music produced. Whereas Blacking had had the intuitions, I felt that I had the technical knowledge of experimental psychology to analyse more systematically what was going on at the "human/musical instrument interface."

In the event, the cross-cultural element of the research was not addressed, for the research on the Irish fiddle was never carried out. The work in Afghanistan had proved very productive. The necessary contrast with the long-necked lute, the *dutar*, was provided by another musical instrument which I found in Afghanistan, the *rubab* (see Figures 3 and 4).

The *Rubab* and the *Dutar*

The *rubab* is a short-necked double-chambered waisted lute, with three main strings and sets of drone and sympathetic strings. It is the national instrument of Afghanistan and played in many parts of the country, being especially important in the music of Kabul. The *dutar* is a long-necked lute with ten or eleven sympathetic strings, with tuning pegs along the neck, and is associated principally with the city of Herat, in western Afghanistan. The fourteen-stringed *dutar* is not an old instrument. It was devised in the early 1960s in order to adapt the long-necked lute of Herat so that it could play the repertoire of the *rubab*, and to allow the Heratis' local instrument to participate in the urban ensemble of Kabuli music, with the singer accompanied by the hand-blown harmonium, *tabla*, *rubab*, and other chordophones (Baily 1976).

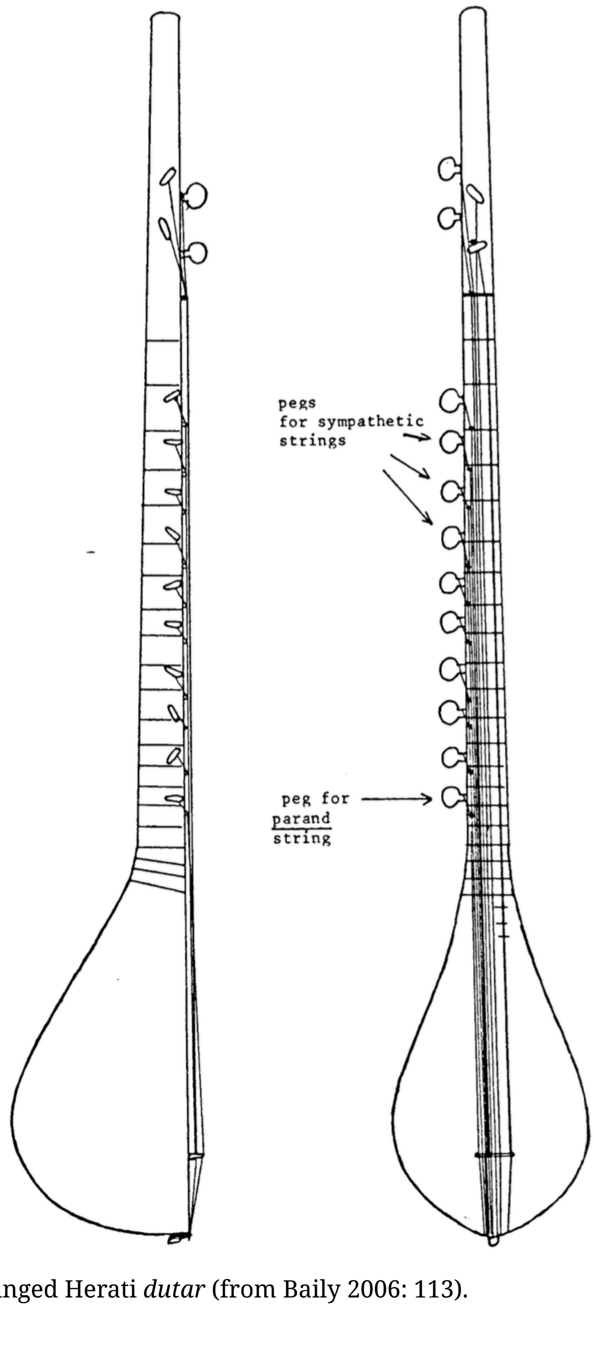

Figure 3. The fourteen-stringed Herati *dutar* (from Baily 2006: 113).

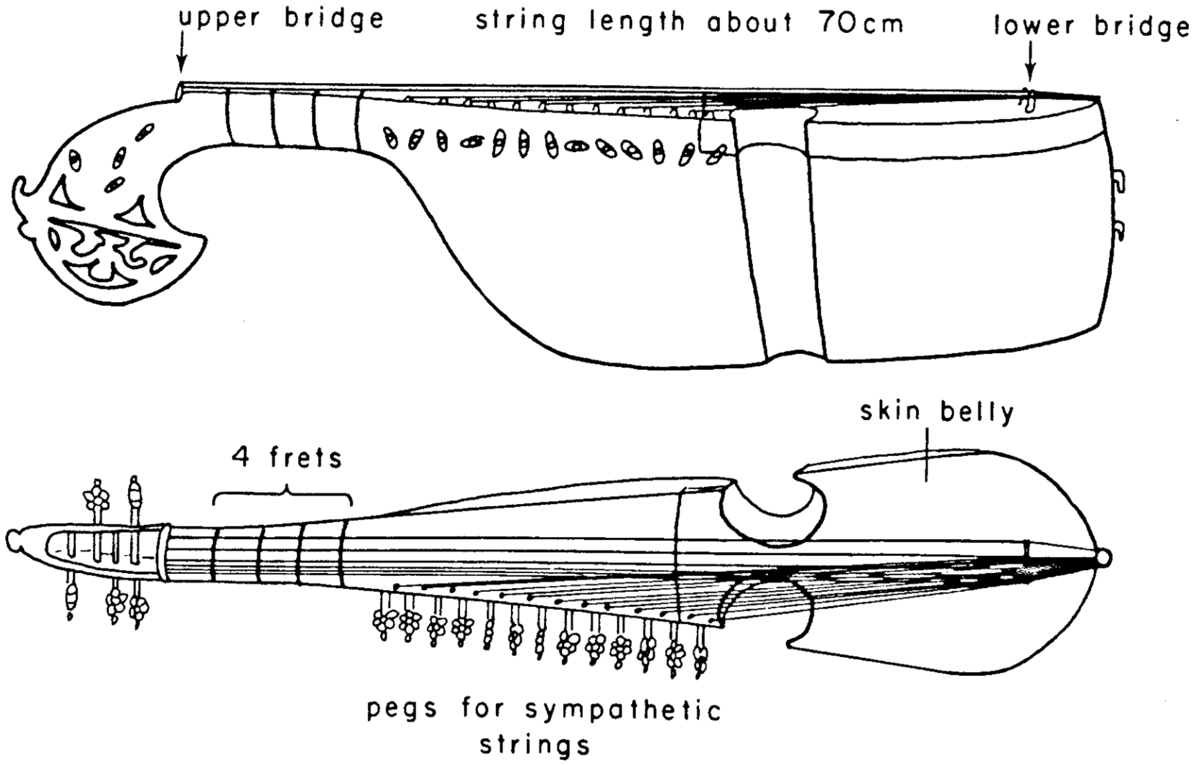

Figure 4. The Afghan *rubab* (from Baily 2006: 114).

The *rubab's* repertoire embraces a variety of genres. For Afghans, perhaps the most highly valued *rubab* music is the four-part, or extended, instrumental piece (*naghma-ye chartuk* or *naghma-ye kashal* – see Baily (1997) for a collection of such pieces). Figure 5 shows a notation for one such piece, in *Rag Kumaj*. The notation illustrates the following points about much *rubab* music: it is melodic rather than harmonic, there is a tendency towards step-wise scalar melodic movement framed within the octave (similar in many respects to North Indian music structure), and melodies are constructed around sixteen-unit metric cycles. The physical changes made to the *dutar* allowed it to play pieces of this kind effectively.

We now look at the *rubab* and the *dutar* as keyboards, with which the left hand of the player interacts. The *rubab* has a fretted range of a nineth, and the frets are arranged to give an approximately tempered tuning with twelve semitones to the octave. The *dutar* has a somewhat greater fretted ambitus, extending to a fourth below the pitch generally taken as tonic. The tuning of the *dutar* is an octave higher than the *rubab*. From the point of view of left-hand movements, the crucial difference between the two instruments is that whereas the notes on the *rubab* are laid out on three strings, which I call a tiered array, the same notes (an octave higher) are laid out on the *dutar* in a single row, which I call a linear array. The layout of note positions is shown in Figure 6, using the *sargam* notation system used by many Afghan musicians. It will be argued that the way in which note positions are laid out, which depends on the morphology of the instrument, has a powerful shaping influence on performance.

Figure 5. *Naghma-ye kashal* in *Rag Kumaj* (from Baily 2006: 115).

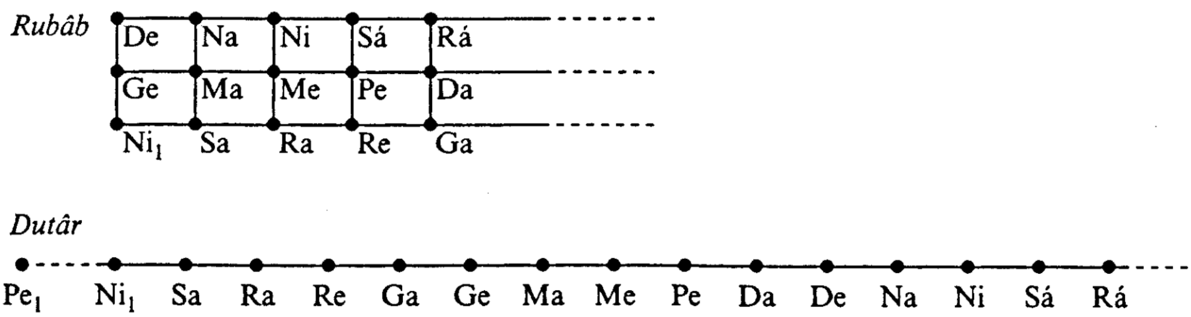

Figure 6. The layout of notes on the *rubab* and the *dutar* (from Baily 2006: 116).

Research Methods

In retrospect I realise that, from the outset, my methodology relied heavily on learning to perform as a mode of research. But it is a curious fact that no mention of this was made in the SSRC grant application. It is as if in the 1970s such an approach might have been deemed to be insufficiently "scientific" by the SSRC and other funding bodies. Learning to perform was to be regarded as a side-issue, a bonus, but not something to be entertained seriously. Even Hood (1960), in discussing "the challenge of bi-musicality" did not advocate learning to perform as a method of research: his argument was simply that training in basic musicianship is fundamental to any kind of musical scholarship. Today, I have an entirely different view of the matter and regard learning to perform as a central pillar of ethnomusicological inquiry (Baily 2001).

I approached learning to play the *dutar* and the *rubab* as a guitarist with an interest in performing modal music, especially North Indian classical music. Nine months before starting my first year of fieldwork in Herat I had obtained a three-stringed *dutar* and made recordings of three *dutar* players in Herat, and used these recordings, plus my own visual observations of the *dutar* players, to teach myself to play. I later discovered that, in some ways, this was not unlike the way most *dutar* players learned, at least initially, through observation and private experimentation (Doubleday and Baily 1995). Once based in Herat I received more formal instruction from two outstanding *dutar* players, Gada Mohammad and Abdul Karim Herawi (popularly known as Karim Dutari), the acknowledged inventor of the fourteen-stringed *dutar*.

In due course, as laid down in the SSRC proposal, I constructed a sample of fifteen *dutar* players, covering players of both three- and fourteen-stringed instruments, and looking at three levels of skill (learners, established performers, virtuosos). For the purposes of comparison I recorded them playing a repertoire of five well-known tunes and also filmed the left-hand movements of ten of the musicians playing these pieces in order to investigate patterns of fingering. Thirteen of the fifteen *dutar* players also participated in extended recorded interviews.

My approach to the *rubab* was much less systematic. The *rubab* was never intended to be an object of special research but, having encountered the instrument, I was keen to learn to play it. In this I was greatly assisted by two months of lessons in Kabul with Ustad Mohammad Omar, Afghanistan's greatest *rubab* player of recent times. This gave me the basic technique and also introduced me to the type of piece known as *naghma-ye chartuk* (or *naghma-ye kashal*) which was very important in understanding the "classical" repertoire of the *rubab*. When I moved to Herat I received no further lessons but made a number of recordings, especially of Rahim Khushnawaz, which I used as a source for learning.

My research on the human/musical instrument interface was therefore quite different to that of Blacking. His analyses of Butembo flute and Nsenga *kalimba* music were made from outside, whereas my analyses of the *dutar* and the *rubab* were conducted from the inside, from the perspective of the practical performer grappling with the instruments in question. In that sense I was using myself as an object of investigation. While this approach might seem unduly subjective I was aware that the nineteenth-century polymath scientist Herman von Helmholtz made many of his important discoveries in acoustics and optics through using himself as an experimental "subject" (Helmholtz 1924). I knew about his work from my wedge prism experiments. My fieldnotes show that many of my intuitions about the *rubab* and the *dutar* came quite early on in my research, when I was struggling to learn to play these instruments. Now, having played them for 30 years, I am even more certain that the analysis offered below is correct.

Interactions at the Interface

The results of the comparison between the *rubab* and the *dutar* are discussed here under three headings:

- the perception of the spatial layout of the keyboard
- how the left hand and its fingers move in relation to the keyboard
- how the right hand activates the melody string(s) to vibrate.

Mapping the Modes

One way of looking at performance on lutes like the *rubab* and the *dutar* is to propose that, in playing a melody, the player generates a sequence of spatial targets and responds to them in turn. The targets are the note positions, the places where you put your fingers to “stop” the strings. As a keyboard, the tiered array of the *rubab* is an easier spatial framework with which to operate because spatial information is encoded in two dimensions rather than in one.

For example, a very common melodic mode played on both the *rubab* and the *dutar* is *Bairami*, similar in some respects to the Phrygian or E mode. Figure 7 shows how the note positions are laid out on the tiered array of the *rubab* and the linear array of the *dutar*.

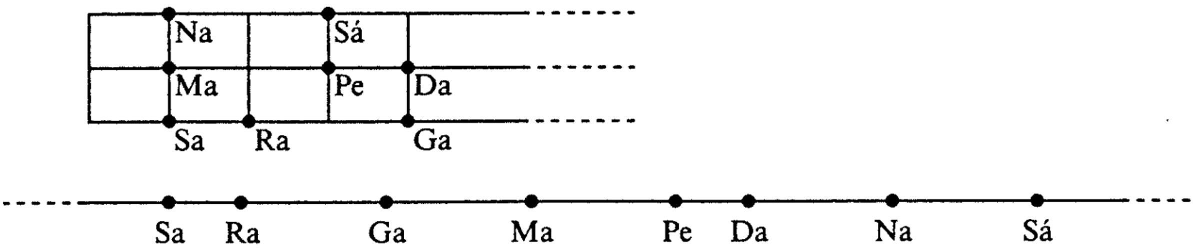

Figure 7. The layout of notes for *Bairami* on the *rubab* and the *dutar* (from Baily 2006: 118).

It is easier to “place” these note positions on the tiered array of the *rubab* than on the linear array of the *dutar*, in the sense of identifying where the notes are located and responding accurately to them. In practical terms, this means that, on the *dutar,* one is more likely to make mistakes – for example, by “taking” the wrong note. To avoid errors one has to play more slowly on the *dutar* than on the *rubab*, and to concentrate more on the technical placement of each note. The difficulty in locating note positions is compounded by the fact that many different modes are played on the *rubab*, and these often involve different configurations of note positions (Baily 1981). Consider the note positions for the modes shown in Figure 8.

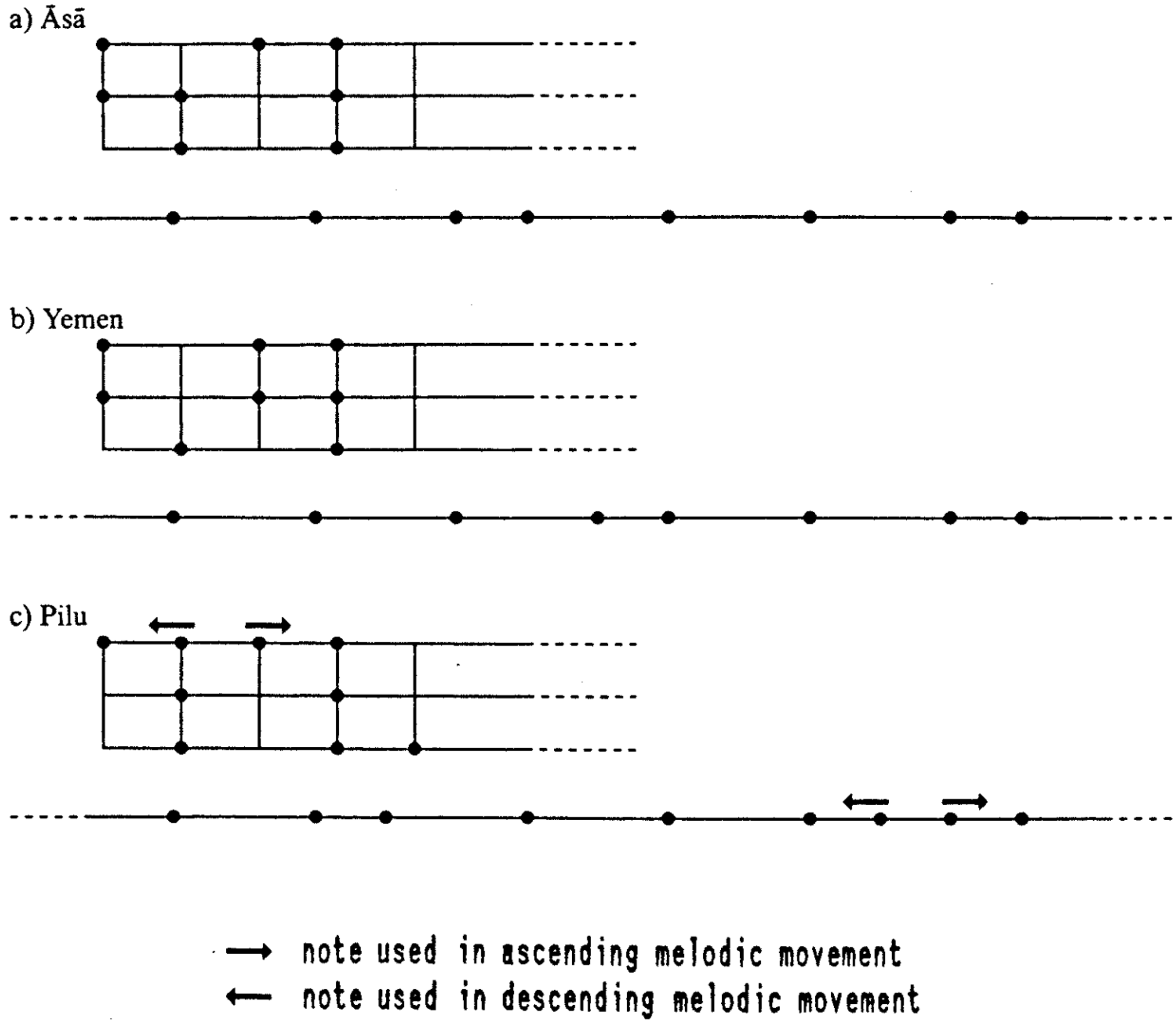

Figure 8. The layout of notes for *Asa, Yemen* and *Pilu* on the *rubab* and the *dutar* (from Baily 2006: 118).

The different configurations which characterise the various modes are more easily remembered on the two-dimensional layout of the tiered array of the *rubab* than on the one-dimensional linear array of the *dutar*. The latter is the more confusing layout with which to work.

In learning to play instruments like the *rubab* and the *dutar*, visual information is very important, and there is no doubt that the keyboard is initially represented cognitively in terms of visual positions in a visual framework. As motor learning proceeds, over a long period of time, the note positions become represented in a more abstract spatial framework that can be apprehended in visual, aural, kinaesthetic, and motor terms. But it seems that the *dutar* remains strongly reliant on visual information, as shown by the fact that performance is dramatically disturbed by blindfolding the player.

Finger versus Hand Movements

A second, but not unrelated, factor concerns the relative accuracy and speed of finger and hand movements. To play an ascending or descending octave scale (that is, a sequence of eight notes framed within the octave) on the *rubab* usually requires only finger movements. The notes required "fall under the fingers." In this respect playing the *rubab* is like playing in the first position on the violin – a position which is characteristic of much folk fiddling. In contrast, playing the same scale patterns on the *dutar* requires considerable hand, rather than finger, movements. Changes in the position of the hand are achieved through shoulder and elbow movements. There is a greater demand for visual information to control these movements, whereas finger movements can proceed mainly under kinaesthetic control. Further, finger movements are generally faster and more accurate than hand movements.

The difference between the *rubab* and the *dutar* illustrates the principle of what psychologists used to call stimulus-response compatibility, in the sense of there being a "good fit" between the layout of a keyboard or control panel and the movements required in dealing with that active surface. The various scalar patterns embodied within the music are more compatible with the tiered array of the *rubab* than with the linear array of the *dutar*. Indeed, it seems very likely that compositions of the *naghma-ye chartuk (naghma-ye kashal)* type were originally composed by *rubab* players.

This conclusion about compatibility receives further support when we consider the original *dutar*, from which the fourteen-stringed instrument developed between 1950 and 1965 (Baily 1976). The word *dutar* means "two strings," and the older form of *dutar* was just that, with two strings made of silk or gut, usually tuned a fourth apart. The music played on that kind of *dutar* was structured within tetrachords rather than within octaves, and performance required sequencing rather than playing scalar passages. A very simple example of a sequenced melody is shown in Figure 9.

Figure 9. Typical sequenced melody (from Baily 2006: 120).

At the level of action, the typical movement pattern for the left hand was to operate in a descending sequence of hand positions, where the fingers operate at each position in "cluster patterns," using the first, second, and third fingers (Baily 1985: 253), as shown in Figure 10.[3]

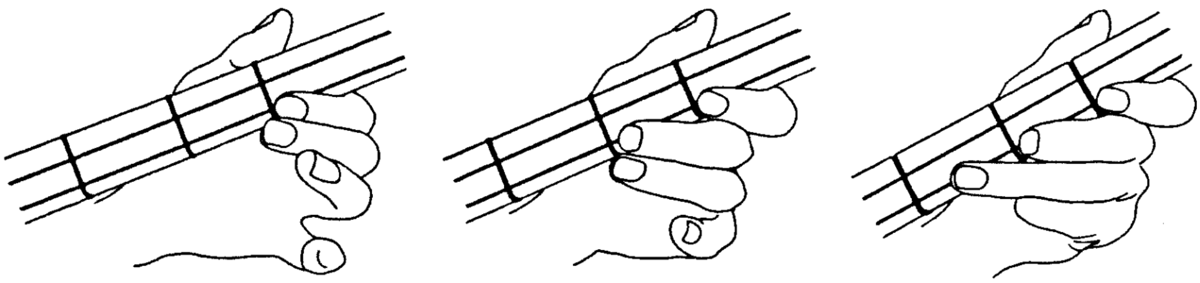

Figure 10. Use of three fingers on the two-stringed *dutar* (from Baily 2006: 120).

Right-Hand Patterns

So far we have discussed the player's left hand. The right hand raises different issues. Both the *rubab* and the *dutar* are played *punteado*, single-string style, with a plectrum. On the *rubab* there is a marked disparity between the downstroke and the upstroke, arising in part from the strongly flexed right-hand position (see Figure 11).

3 This "three-finger three-component action" style of performance is typical of the two Persian long-necked lutes, the *tar* and the *sehtar*.

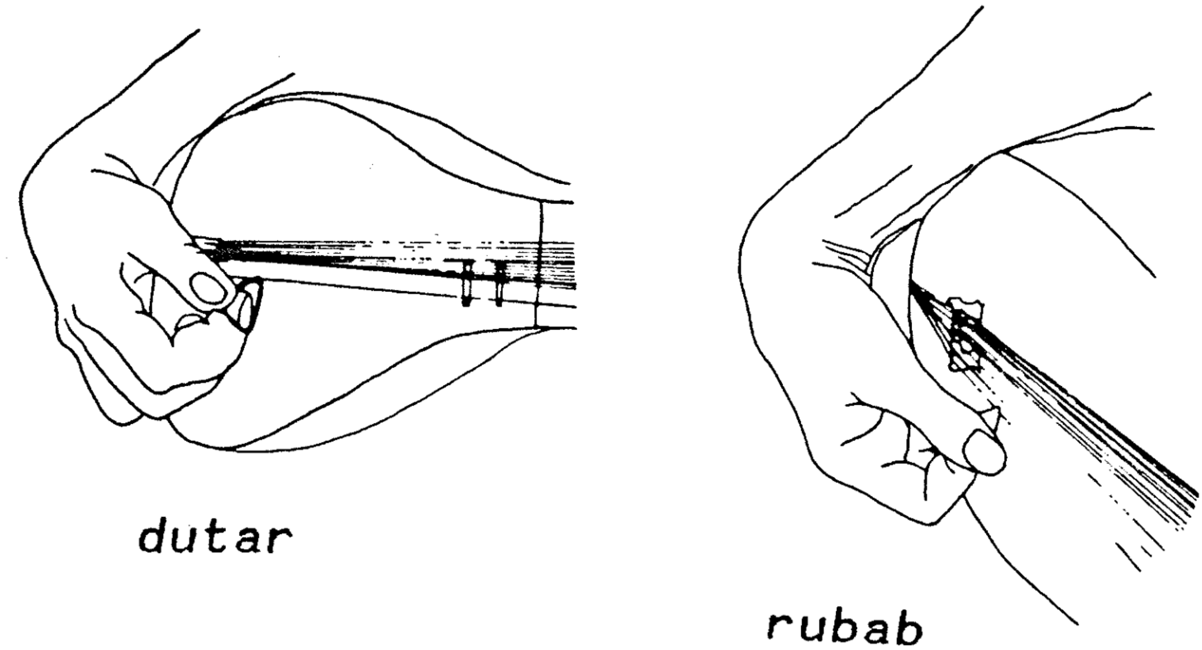

Figure 11. Right-hand positions for the *dutar* and the *rubab* (from Baily 2006: 120).

The downstroke is strong, with added percussion from the hand itself hitting the skin belly of the instrument as the plectrum strikes the strings. The upstroke is much weaker in amplitude, and acoustically thinner, with no skin sound. Downstroke and upstroke sound very different, and this disparity allows one to create a rich variety of rhythmic patterns by sequencing these two elements according to a simple set of rules when playing the *rubab* (Baily 1990, 1991).

The *rubab's* complex right-hand technique has been transferred to the *dutar*. Again, the downstroke is stronger and more percussive than the upstroke. The metal plectrum tends to click on the *dutar's* wooden belly on the downstroke. But now the *dutar* has the advantage in ergonomic terms, since the right hand has to deal with only one melody string rather than with three. This avoids making cross-movements taking the plectrum from one string to another that are required on the *rubab*. In particular, the single melody string of the *dutar* eliminates the technical problem of changing strings after a downstroke and before an immediately succeeding upstroke, which involves interpolating an extra lateral movement between the two (Baily 1991: 158).

Conclusions from the Comparison between the Rubab and the Dutar

The work that I carried out in collaboration with Blacking on the *rubab* and the *dutar* served to identify a number of factors operating at the interface between the human sensorimotor system and a musical instrument. It showed some of the ways in which the interaction between human body and instrument is connected with the structure of the music produced. The research also made us aware of some other factors that need to be taken into consideration:

> 1. Musical styles vary widely with respect to the degree to which the characteristic motor patterns of their performance techniques embody the constraints imposed by the morphology of the instrument and use movements and sequences of movements that are intrinsically easy for the human sensorimotor system to organise. However, the constraints inherent in a particular spatial layout may be transcended to varying degrees. Baily (1977) argued that the transformation of the Herati *dutar* from a two-stringed instrument of rural folk music to a fourteen-stringed instrument of urban art

> and popular music was accompanied by a *decrease* in compatibility and an *increase* in the skill required to play it (measurable in terms of length of time to reach the socially accepted level of musicianly performance).
>
> 2. The demonstration of the ergonomic relationships leaves unanswered the question of whether the instrument shapes the music or is selected because it fits pre-existing music. In the case of the fourteen-stringed *dutar*, the instrument was modified to equip it to play a repertory seemingly developed with reference to another instrument, the *rubab*. This was, of course, new music for the *dutar*. The alternative possibility, that the instrument shapes the music, would have been more interesting, showing how new music may arise from discovering new ways of moving in relation to the instrument. This idea is implicit in the quote from Nettl (1964: 209) cited earlier in this chapter (see also the quote from Jimi Hendrix in Baily and Driver 1992: 67).
>
> 3. Cases where we can identify a particular instrument exclusively with one kind of music are perhaps somewhat rare. Theories about a close relationship between a morphology and a music run into two kinds of complication:
>
> (a) Instruments with very different morphologies are used in many societies to play the same music, often brought together in a single ensemble (for example, Irish music, or Iranian music);
>
> (b) certain instruments, such as the violin, the accordion, and the guitar, are used to play a range of very different kinds of music around the world.
>
> 4. With respect to the first issue, it remains the case that special relationships between instruments and their music are recognised. One speaks of a "piper's tune," or of a "fiddle tune" in Irish music, indicating that these pieces have characteristics which adapt them specially well to the instrument in question. With respect to the second issue, there is clearly a need for cross-cultural studies of instruments such as the violin, accordion, and guitar to see how the same morphology is used in radically different ways. A pioneering study of this kind is the analysis of folk blues guitar-playing carried out by Baily and Driver (1992).[4]

The results of the research in Afghanistan were presented at the ASA Conference convened by Blacking in 1975 at Queen's University Belfast on "The Anthropology of the Body" and published in the conference proceedings (Baily 1977). The approach to the human/musical instrument interface that Blacking and I pioneered has been adopted by a few other ethnomusicologists, although progress in this potentially fruitful area of cognitive ethnomusicology is hampered by the fact that few ethnomusicologists have any training in experimental psychology.[5] Three studies are worth special mention. Jonathan Stock (1993) has offered an analysis of Chinese *erhu* playing which embodies some of the principles described above. Risto Pekka Pennanen, in his PhD thesis (Pennanen 1999) has done something similar for the Greek *bouzouki*. Olga Velichkina, in her PhD thesis (Velichkina 1998), has applied similar ideas to women's panpipe playing in Southern Russia.

Blacking saw ethnomusicology as developing on a broad front, in which its practitioners sought, according to their own individual skills and interests, to "identify all processes that are relevant to an explanation of musical sound" (Blacking 1973: 17). What goes on at the body-instrument interface is just one piece of that complex jigsaw that we call music, and Blacking

4 Bennett and Dawe (2001) offer important insights into the guitar as an instrument of global performance.
5 The Music Department of Ohio State University is one of the few places where cognitive ethnomusicology is being nurtured. However, it is clear that important insights into the issues discussed here can be had by those without special training in psychology. For example, Bell Yung wrote a very interesting paper on choreographic and kinaesthetic elements in performance on the Chinese seven-string zither as a result of learning to perform on the instrument (see Yung 1984).

understood the contribution that experimental psychology could make to further our knowledge and understanding of this supreme mystery.

References

Baily, John. 1972a. "Adaptation to Prisms: Do Proprioceptive Changes Mediate Adapted Behaviour with Ballistic Arm Movements?" *Quarterly Journal of Experimental Psychology* 24: 8–20.

___. 1972b. "Arm-Body Adaptation with Passive Arm Movements," *Perception and Psychophysics* 12: 39–44.

___. 1974. *Krishna Govinda's Rudiments of Tabla Playing*. Brighton: Unicorn Books.

___. 1976. "Recent Changes in the Dutar of Herat," *Asian Music* 8(1): 29–64.

___. 1977. "Movement Patterns in Playing the Herati Dutar." In *The Anthropology of the Body*, edited by John Blacking, 275–330. London: Academic Press.

___. 1981. "A System of Modes Used in the Urban Music of Afghanistan," *Ethnomusicology* 25(1): 1–39.

___. 1985. "Music Structure and Human Movement." In *Musical Structure and Cognition*, edited by Peter Howell, Ian Cross, and Robert West, 237–58. London: Academic Press.

___. 1990. "John Blacking and His Place in Ethnomusicology," *Yearbook for Traditional Music* 22: xii-xxi.

___. 1991. "Some Cognitive Aspects of Motor Planning in Musical Performance," *Psychologica Belgica* 31(2): 147–62.

___. 1994. *John Blacking: Dialogue with the Ancestors*. John Blacking Memorial Lecture 1991, London: Goldsmiths College.

___. 1997. "The *Naghma-ye Kashdl* of Afghanistan," *British Journal of Ethnomusicology* 6: 117–63.

___. 2001. "Learning to Perform as a Research Technique in Ethnomusicology," *British Journal of Ethnomusicology* 10(2): 85–98.

___. 2006. "John Blacking and the 'Human/Musical Instrument Interface': Two Plucked Lutes from Afghanistan." In *The Musical Human: Rethinking John Blacking's Ethnomusicology in the Twenty-first Century*, edited by Suzel Ana Reily, 107–23. Aldershot: Ashgate.

Baily, John, and Peter Driver. 1992. "Spatio-motor Thinking in Playing Folk Blues Guitar," *The World of Music* 34(3): 57–71.

Bennett, Andy, and Kevin Dawe. 2001. *Guitar Cultures*. Oxford: Berg.

Blacking, John. 1955. "Eight Flute Tunes from Butembo, East Belgian Congo," *African Music* 1(2): 24–52.

___. 1959. "Patterns of Nsenga *Kalimba* Music," *African Music* 2(4): 26–43.

___. 1973. *How Musical is Man?* Seattle: University of Washington Press.

___. 1990. "Music in Children's Cognitive and Affective Development." In *Music and Child Development: Proceedings of the 1987 Denver Conference*, edited by Frank Wilson and Franz Roehmann, 68–78. St Louis: MMB Music.

Blacking, John, and John Baily. 1973. "A Cross-cultural Study of Music Skills," unpublished, SSRC application for a research grant.

Doubleday, Veronica, and John Baily. 1995. "Patterns of Musical Development among Children in Afghanistan." In *Children in the Muslim Middle East Today*, edited by Elizabeth Warnock Fernea, 431–46. Austin: Texas University Press.

Helmhotlz, Herman von. 1924. *Helmholtz's Treatise on Physiological Optics*, translated by J. P. Southall. New York: Dover.

Hood, Mantle. 1960. "The Challenge of 'Bi-musicality'," *Ethnomusicology* 4(2): 55–9.

Nettl, Bruno. 1964. *Theory and Method in Ethnomusicology*. New York: The Free Press of Glencoe.

Pennanen, Risto Pekka. 1999. *Westernisation and Modernisation in Greek Popular Music*. Tampere: University of Tampere Press.

Sachs, Curt. 1962. *The Wellsprings of Music*. The Hague: M. Nijhoff.

Stock, Jonathan P.J. 1993. "An Ethnomusicological Perspective on Musical Style, with Reference to Music for Chinese Two-stringed Fiddles," *Journal of the Royal Musicological Association* 118(2): 276–99.

Velichkina, Olga. 1998. *Playing Panpipes in Southern Russia: History, Ethnography and Performance Practices*. PhD thesis, Ohio State University.

Yung, Bell. 1984. "Choreographic and Kinesthetic Elements in Performance on the Chinese Seven-string Zither," *Ethnomusicology* 28(3): 505–17.

About the author

John Baily
Goldsmiths, University of London
j.baily@gold.ac.uk

John Baily came into ethnomusicology from experimental psychology, with a doctorate on human spatial coordination and motor control from the University of Sussex. In 1973 he became a Post-Doctoral Research Fellow in the Department of Social Anthropology, Queen's University of Belfast, and in collaboration with John Blacking conducted two years of ethnomusicological fieldwork in Afghanistan. In 1978, he was appointed Lecturer in Ethnomusicology at Queen's. From 1984 to 1986, he trained in anthropological film making at the National Film and Television School and directed the award-winning film *Amir: An Afghan Refugee Musician's Life in Peshawar, Pakistan*. From 1988 to 1990, he was Associate Professor in the Centre for Ethnomusicology, Columbia University, New York. He joined Goldsmiths in 1990 and is now Emeritus Professor of Ethnomusicology and remains Head of the Afghanistan Music Unit.