

Understanding Musical Time Sense

— concepts, sketches and consequences —

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1. Introduction

The question posed here is: how does music convey the sense of time? I will provide no exhaustive answer to this question but hope that the examples offered will provide some insight into how various attitudes towards and different aspects of experiencing time are conveyed in a number of specific cultural situations. I also hope that some of the interpretations presented below will lead to a discussion of the vital role which musicology should be playing in our society today.¹

2. Definitions

Before discussing particular examples of time sense in music, we need to establish some working definitions of concepts used in this article.

2.1. 'Music'

I have previously tried to delimit the meaning of the word 'music' as:

'that form of interhuman communication in which experienceable affective states and processes are conceived and transmitted as humanly organised, nonverbal sound structures from those producing these sounds to either themselves or to others who have acquired the chiefly intuitive cultural skill of decoding the 'meaning' of these sounds in the form of a adequate response' (Tagg, 1981:7).

It is necessary to add here that what is meant by 'music' — whether the culture under discussion conceptualises it in the same way or not — should, together with dance, be regarded as a symbolic system particularly suited to the immediate affective expression of social identity or cultural collectivity. This is because the act of making music entails the organisation of different sounds — most frequently as different voices or instruments producing either the same or different musical events — in a certain order and because such activity is dependent on socially determined rules of aesthetics and cooperation for the music to exist in the first place. Moreover, it is clear that different sociomusical rules are in operation across the world, rules determining not only the ordering of musical materials in different ways but also which (sets of) sounds may be considered as musical in the first place or appropriate for use in different contexts. Such varying sets of rules governing musical structuration in different cultures and subcultures contribute strong-

1. This paper is a radically revised and expanded version of the homonymous article published in 1984 in Jan Ling's fiftieth birthday Festschrift *Tvärspel* (Göteborg, Skrifter från musikvetenskapliga institutionen, nr 9), pp. 11-43. That article was in its turn based on a short paper prepared for *Riksställningar* (Swedish National Exhibitions) and their 1980 exhibition on 'time', an exhibition which to my knowledge never saw the light of day.

ly to the construction of ideology by establishing different symbolic universes of affective, gestural and corporeal attitudes or behaviour. As Berger and Luckman (1967) originally stated and as scholars such as Blacking (1976) and Feld (1990) have demonstrated, symbolic universes in music can act either inclusively or exclusively. To put it simply, you either belong to those using musical structuration rules of type *a* to express messages of type *b* in relation to phenomena of type *c* in social context *d*, under which circumstances and in response to which you exhibit responses of type *x* (inclusion) or you do not (exclusion).

In this article we are concerned with varying rules of musical structuration relating to the phenomenon of time. This requires that we first attempt to provide working definitions of terms relating music to time ('tempo', 'pulse' etc.) and then of concepts related more exclusively to time.

2.2. 'Tempo'

Tempo is of course Italian or Portuguese for 'time'. When applied to music, however, 'tempo' is the underlying 'pace' or 'speed' at which music is performed, this being one determinant of the time taken to realise a particular sequence of musical sounds. 'Speed' in this context refers to the relative position (implicit or explicit) of the music's 'pulse' (i.e. rate of beats per unit of time) on a sliding, finite, bipolar scale ranging from slow to fast.

Musical pulse is directly relatable to the pulse of the human heart, ranging from a minimum slow of forty beats per minute (40 bpm) to a maximum fast at just over two hundred (200 bpm).² The poles of this scale correspond almost exactly with those of the European metronome, which measures tempo from a *larghissimo* low/slow of 40 bpm to a *prestissimo* high/fast of 208 bpm. Mean tempo on the metronome is therefore around 91 bpm, i.e. just over twice the minimum and just under half the maximum rate on the scale ($40 \times 2.3 = 91$ and $91 \times 2.3 = 208$). This tempo (91 bpm) also corresponds to the (heart) pulse rate of an average male adult walking at an easy pace. Any theoretical tempo exceeding or falling short of this mean pulse by a factor greater than two will thus automatically tend to be divided or multiplied by two in order to bring the tempo into the vicinity of a 1:1 relationship with the beat of the human heart. We should therefore expect tempo in music to be an important parameter in determining the human/biological aspect of an affective relationship to time.

2.3. Linear time

By 'linear time' is meant the widely accepted abstraction of 'absolute' passing time, symbolisable as a unidirectional, unidimensional axis from past into future, i.e. as an utterly straight line along which no point (in time) can recur. A dialectical materialist view of linear time posits the intrinsic irreversibility of time as inextricably related to the demonstrable irreversibility of material processes, whereas idealistic philosophies of linear time tend to dissociate time from the spatial and material processes upon which the notional viability of linear time ultimately depends. The idealist view of linear time

2. Thanks to Åke Park, my neighbour in Göteborg (1977-91), and his *Bra Böckers Läkarslexikon*, vol. 5: 145-146 (Höganäs, 1982). According to this 'Home Doctor Encyclopedia' work, a highly trained athlete's pulse rate can, if measured during rest, be as low as 40 bpm. The pulse of a small child expounding much energy in a state of excitement can occasionally exceed 200.

(e.g. Kant) underpins the metaphysical fallacy of culturally and historically specific phenomena being imagined as capable of transcending both time and matter. We shall therefore, unless otherwise stated, be using the term 'linear time' in its dialectical materialist, not idealist, sense.³

Linear time models are used extensively in the graphic and scribal representation of musical processes. For example, notation starts top left of the first page and, with the exception of repeat marks, ends bottom right of the last page, while the abstraction of musical 'form' (in the sense of order of events) is expressed in such terms such as 'AABA'. Similar principles of linear temporality apply to the storage of sound on tape, vinyl, CD and computer disks.⁴ However, as we shall see, a lot of music (which by definition occupies a certain duration of linear time) is heard as cyclical rather than linear. This problem is related to contradictions between other concurrent notions or representations of time in our society.

Although we regard returning to the same place as perfectly natural, despite the fact that that place will have inevitably changed in many materially verifiable ways — not to mention the fact that we will have changed and that such a change will bring about differences in our relation to that place —, we tend nevertheless to consider returning to the same (place in) time as either philosophically absurd or as an imaginative exercise in science fiction narrative. Now, if, as we have proposed, the irreversible march of time is dependent on the irreversibility of material processes, then returning to the same place ought to be as illogical as returning to the same time. However, 'we'll meet again, same time, same place' has been a perfectly acceptable statement in our culture for some time.⁵ It demonstrates the existence of non-linear notions of time and place, notions inferring that points in both time and place can in fact be revisited. Such notions are of course intersubjectively verifiable and therefore culturally specific.

The contradiction between linear and non-linear notions pervades even our measurement of time. Whereas we find it quite natural to use circular clocks and to talk about fifteen seconds past every minute, twenty minutes past every hour, noon every day, Tuesday every week, the first week in every month, Christmas every year etc., we do not admit the recurrence of years.

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3. Askin (1969:84), discussing contradictions between philosophies underlying methods of dating stages in the earth's geological development ('relative' and 'absolute geological time'), concludes: 'the definition of time according to the categories of duration and succession proves inadequate in defining the essence of time' (p. 84) ... 'The theory of relativity sees time as an indissoluble unit of matter in movement, according to whose state the properties of time itself also change' (p. 214) (author's translations). The first chapter of Askin (1967:21-37) is devoted to a critique of Kant's basically idealist notion of time, mostly as set forth in later philosophers' discussion of Kant's *Critique of Pure Reason and Logic*.
 4. Obviously, neither minidisks nor computer disks necessarily store musical events in contiguous clusters corresponding to their occurrence in real time. However, digital storage of music always includes the linear temporal ordering of relevant disk clusters among the music's file attribute details.
 5. 'It is perhaps important to consider that a nun who spends sixty years in a Carmelite enclosure, if she is in the chapel choir for Mass and Readings at 8 am and 8 pm every day, is in the same place at the same time exactly 42,800 times during those years'. Drid Williams 'The Brides of Christ', in *Perceiving Women*, ed. S Ardener (London, Dent, 1975:115), cited by Young (1988:288). 'Similarly, continues Young (*loc.cit.*), 'a Benedictine monk who lasted as long could have heard the same bells calling him to prayer' [in the same place at the same times] 'not far from two hundred thousand times'.

In other words, while the Chinese can refer to years in either linear or cyclical terms, the year 1968, unlike the year of the monkey, can only exist once. This means that although we seem perfectly prepared to accept the cultural recurrence of time on a small scale, we are somehow unable to do so if the duration in question (in this case years) is equal to or greater than that by which we measure the duration of human life. All this implies in its turn that any cyclical process, social or natural, whose periodicity exceeds an average lifetime will be far more difficult for us to conceptualise than those experienceable as cyclical by one and the same individual rather than by a stable community spanning several generations or centuries. Since, unlike hours or days, years and centuries span far beyond the subjectively tangible cycles of our own lives, these longer measurements of duration have, in our culture, acquired an aura of greater objectivity, imagined (erroneously, as we shall see) to be related to historical and material processes beyond our control.⁶

It is therefore hardly surprising to discover that the hegemony of the linear view of time is generally associated with the rise of mercantile capitalism, with its need for industrial and social precision brought about by an increasing specialisation of labour and the consequent need for planned management and synchronisation of production processes, the correct timing of the exchange of goods and services to produce maximum profit and to increase rates of turnover etc.⁷ Nor should it come as any surprise to discover that the rationale of linear time is based on Newtonian physics, which uses the term 'absolute time' to denote the concept.⁸ The whole of this process in the social understanding of time in Europe is described in detail by Cipolla in his *Clocks and Society* (1978).

2.4. Cyclical time

By 'cyclical time' is meant the view of time which enables humans to experience equidistant points along the unidirectional axis of linear time as regular recurrences of the 'same time', e.g. sunrises, sunsets, weekends, tides, seasons, annual festivals, etc., according to socially, culturally and materially determined factors.

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6. 'The modern view seems to be that the cyclical may have been perfectly acceptable in some ancient societies in which the wheel and the mandala were appropriate symbols for time, but not for us. We can read, but only as if from a great distance, that in India an elaborate system of longer cycles was added to the natural recurrences of the days, months, and years, with 360 ordinary years making a divine year and 12,000 divine years forming another repeating cycle' (Young 1988:5, citing Mircea Eliade, *The Myth of the Eternal Return* (Princeton, 1954), pp. 113-113).
 7. The hegemony of linear time is, of course, also associated with the rise of the bourgeois notion of the individual, with the monorhythmisation and strophisation of European music, discussed under section 3.3, and with the relation of those processes to the emergence of the figure/ground dualism within European visual arts and of the melody/accompaniment dualism within European music.
 8. This does not mean to say that Newton's notion of time was basically non-materialist or non-dialectic. He saw time and space as 'existing in mutual interdependence' and as 'a sort of receptacle of themselves and of all existing things' (Askin 1969:30, quoting Newton's *Mathematical Principles of Natural Philosophy*). However, without access to the theory of relativity, according to which properties of time vary in relation to the varying properties of matter, it must have been hard to avoid such metaphysical mystification as the possibility that space and time could exist free from all matter which fills them because 'matter is not necessarily everywhere' and because space is 'the unlimited sensory medium of God' (*ibid.* p. 31, quoting Newton's *Optics*).

As we have already mentioned, and as Young (1988) repeatedly observes, our rational tradition of scribally disseminated knowledge, clearly related to the rise and hegemony of capitalism, seems to accord greater credence to linear than to cyclical time.⁹ Young criticises not only the human suffering but also the ergonomic and social inefficiency resulting from this one-sided notion of time, illustrating his argument with copious evidence of natural rhythms affecting human behaviour. Of course, the most notable paradox is that very little public notice seems to be taken of the menstrual cycle experienced by over half the adult population, even though feminine hygiene is one of today's most profitable areas of industrial exploitation.¹⁰ There are, however, other important human cycles that are even more neglected, for example:¹¹

<i>Cycle</i>	<i>Duration</i>
• bioelectric nervous wave	0.1"
• heartbeat complex	1"
• ventilation (4")	4"
• blood circuit flow	10"
• blood flow oscillations	30"
• metabolic oscillations	1:40"
• vasomotor oscillations	6:40"
• fast endocrine oscillations	5-16m
• gas exchange oscillations	33m
• metabolic fuel oscillations	1h 23m
• heat balance oscillations	3h
• circadian rhythms	24h
• water cycles	3.5 days
• longer-range endocrine rhythms	1 month

Some of these cycles may be of direct relevance to the understanding of time sense in music and will be discussed later.

2.5. 'Present time'

One advantage of thinking in terms of cyclical time in connection with music is that it constitutes a perceptual, rather than conceptual, system of durations. Whereas linear time cannot logically admit the existence of the present, except in terms of a theoretical point of zero duration as the immediate future slips into the immediate past, cyclical time on the other hand, as a phenomenon of shared perception, allows such a moment to be understood as 'present time' which may be extended or recur, 'more like a dash than a dot'.¹² This notion of the present is, as we shall see, of cardinal importance in the discussion of time in music and has its material basis in the

9. The most notable loss of cyclical time measurement in urban society is that determined by the moon, replaced by constant artificial lighting in the city but an essential cyclical feature of life for those dependent on tides or on light by which to harvest crops at night.

10. This whole area is fraught with taboo and inconsistency. The amount of British TV advertising for female hygiene products is enormous (currently Tampax, Bodyform and Lillets) and enormously expensive. Absorption properties must be shown with clear blue liquids, never red, while premenstrual changes of mood are never mentioned. Similarly, the successful career woman can now purchase menstrual planning sheets to include in her Filofax, even if the company she works for makes no allowance for her monthly ordeal or for her state of mind the week before.

11. Table adapted from Young (1988: 36). 'm' = minutes, 'h' = hours. A 'ventilation' is one complete cycle of breathing in and out.

12. Young 1988: 11.

fact that very short-term memory (spanning present time in the sense of the truly immediate past) and long-term memory involve different neurological processes.¹³ Moreover, if, as Young (1988: 11) points out, 'the stretched simultaneity of the present is what makes possible the sense of movement', then concepts of cyclical time and of the present as 'more of a dash than a dot' become essential to the understanding of time and movement in music. Since concepts like 'pulse', 'tempo', 'speed', 'rhythm', 'bar', 'metre', 'phrase', 'period', 'passage', 'section', 'movement' etc. are all connected with movement in both space and time, the linear time model is obviously unsuitable when discussing music, in which 'times' — as sets of musical events containable within an extended present time — can occur many 'times'.¹⁴

2.6. The hierarchy of durations

Between microcosms and macrocosms of linear time durations, i.e. between 'moments' of present time¹⁵ and eternity, our culture has established a conceptual hierarchy, expressed in terms of units ('lengths') of linear time, ranging from milliseconds to millennia. Concepts of duration in musical structures range, in ascending order of length (note once again the linguistic confusion of concepts of time and space), from the 'tone beat' and museme (Seeger, 1960: 76; Tagg, 1979: 70-73), through musical phrases, periods, sections, movements and pieces to 'works' (opuses) as long as a Wagner opera, a complete concert, a complete performance or festival, in other words from less than a second to several days.

The basis for all such conceptual units of musical duration is recurrence, either as repetition or reprise (the latter implying that there are changes which mark the recurrence), i.e. the measure and manner in which the same or similar musical structure can be regarded by a given musical-cultural community as establishing a pattern of occurrence (Middleton, 1983).¹⁶ This rule applies not only to the recurrence of everything from the pulse of the music and tone beats or riffs (microcosm) to the start of another 'work' or a new fifteen-minute batch of Muzak, but also to recurrences of the same musical structures over far greater durations, e.g. every Christmas, every birthday, every death or wedding. The types of such recurrence and change at various

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13. 'I am grateful to Professor Maynard Smith for pointing out to me that 'short-term' and 'long-term' memory are presumably different processes. One can lose the latter without losing the former, and the opposite process happens in some old people' (Young 1988: 85-86 and 277, footnote 18). See also Russell 1959, Eliot n.d: 13-20, Tagg 1979: 184-186. For more on present time in music, see. Wellek 1963: 109, Shepherd 1977: 18-68, Tagg 1979: 226-229.
 14. For further discussion on tone beats, musemes, present time, cyclical time, etc. in music, see Tagg (1979): 70-73, 184-186, 226-229.
 15. Note the original meaning of words for 'moment' (= a movement), such as *ögonblick*, *Augenblick* (= blinking of an eye), 'minute' (= tiny), 'instant' (implying time standing still). Also interesting are expressions like 'a heartbeat away' or 'War, children, it's just a shot away' and 'Love, sister, it's just a kiss away' (Rolling Stones: 'Gimme Shelter' on LP *Let it Bleed* (1968), Decca SKL 5025).
 16. There is not much stringency used in distinguishing between the terms 'repetition', 'recurrence' and 'reprise'. If discussed at all by musicologists, 'recurrence' (the large set including repetitions and reprises), is usually regarded as a totally intrageneric/intramodal phenomenon without socially symbolic meaning. Middleton's (1983) article is a notable exception to this trend and marks an important step in the understanding of musical recurrence. It is also worth noting that such common musical terms as 'tremolando', 'ostinato', 'riff', 'turnaround', 'recapitulation', 'return', 're-entry', 'refrain', 'verse', 'rondo', 'variations' and 'chorus' all define different ways of structuring recurrence in music.

levels of the musical hierarchy of durations will obviously vary from culture to culture in both time and space, according to the social practices and ideology (in the broadest sense of the term) of the culture or subculture concerned. We should therefore expect different cultures to exhibit different musical-structural traits which will embody a variety of affective relationships as regards time (a) between individuals and their social and natural environments, (b) between two or more socially determinable groups (of individuals).

This discussion raises some tricky questions. Since any study of time in music would have to be culturally comparative, what generally acceptable criteria could be used for qualifying our durations in terms of 'length' or frequency of recurrence? Would we need to resort to the Newtonian 'absolute' time scale? Could we use bio-acoustic and bio-haptic universals, such as heartbeats (pulse), breathing rates or any of the other sonic, corporeal and haptic time patterns created during such universally practised human acts as jumping, fighting, sleeping, making love, chewing, not to mention the paces (= size or tempo of footsteps — confusion of time and space again!) determined by strolling, walking, running, etc.? How could such humanly universal time patterns be related satisfactorily to social time patterns of work, ceremony, entertainment and their periodic recurrences? How could the social meanings of these relations be convincingly interpreted? How do individuals socialise their time sense through music in different cultural contexts?¹⁷ How does music communicate socially acceptable/unacceptable types of affective relationship between the different levels in the durational hierarchy of linear or cyclical time? This paper answers none of these questions. However, perhaps a little light can be shed on the matter if we briefly consider at a slightly less abstract level of discourse some of the phenomena mentioned thus far by discussing a few examples of time sense in a number of musical cultures.

3. Historical and anthropological excursion

3.1. Agrarian communities

Amongst most hunters and collectors, as well as in many rural peasant communities, there is neither 'clock time', nor does 'music' exist as a concept (Keil, 1977; Tagg, 1993).¹⁸ 'Pieces' of music neither start nor finish in the clear-cut way we are used to — though the permanent flow of sounds on pop radio stations with their fade-ins and fade-outs are currently changing this pattern — since (as with the pop DJ) they are more integrally woven into the totality of everyday life where real, though not necessarily conceptualised, delimitations between the social and individual, the private and public, work and leisure, the rational and emotional are less well-defined than we gener-

17. 'Socialise' is used here in the sense of acquiring social skills, i.e. *sozialisieren* as understood by the Habermas school of sociocultural theorists. Subsequent change of meaning in this article, e.g. to the Marxian sense of *vergesellschaften*, this will be duly indicated.

18. During a visit to the Department of Musicology at Göteborg in November, 1983, Klevor Abo, from the Institute of African Studies at the University of Ghana, explained that his people, the Ewe of South-Eastern Ghana, use the English term 'music' to denote musical situations and structures imported by British colonialism and Anglo-American neo-colonialism. In the traditional peasant society of the Ewe, however, the nearest equivalent to 'music' seems to be *vù há*. *Vù* really means 'drum' and *há* song. *Vù há* denotes the complete performance of music, singing, drumming, dancing, drama, etc. (see Tagg, 1984).

ally admit them to be in our own society.¹⁹ Yet although the passing of linear time may not necessarily be emphasised by fixed durations between the stopping, starting and changing of 'pieces' of music, music in these societies nevertheless associates with time at a microcosmic level in a broader sense.

Music can, for example, express the collective attitude to be assumed at certain times of day for certain activities (e.g. before the hunt, as a work song) or at certain times of the year (e.g. harvest rites) or at certain stages in the life cycle (e.g. initiation rites, birth and death). In this way music can be seen as ritualising recurrent events in the social life of members of a community. Music also expresses time at a microcosmic level, as can be seen in differences between tempo or rhythmic intensity if one compares a collective song in which members of a given community prepare themselves for an elephant hunt or sing lullabies.²⁰ Obviously, the pace required in conjunction with a hunt — intensity of heartbeat, speed of eye, of hands, arms, feet and breathing — will be far greater than that needed for singing a child to sleep. Time must therefore be expressed and communicated differently in these two situations. In the case of the hunt, quick, sudden movements enacted with the precision of split seconds are vital ingredients of the activity, but they would be detrimental when trying to send a child to sleep.²¹

3.2. India

We should expect to see special differences in the musical structuring of time sense if we compare the music of two classes living in the same society. Unfortunately there is little or no source material for studying 'folk' music from the early Indus culture but, judging from the state of musics in India a few decades ago,²² some observations can be made about the matter in hand.

The most obvious time difference between 'folk' and 'high' art in Indian music (a dubious pair of opposites, this implying either that 'folk' are 'low' or that 'high' art has nothing to do with real people) seems to lie in differences of duration. Whereas Indian folk music²³ seems mainly to consist of musical entities ('pieces'?) lasting between two and five minutes each and cast in the mould of typically popular forms, such as love songs, dances, work songs, comic songs, etc., the classical raga music of Northern India consists of performances lasting for several hours and is connected to a whole sphere of

19. The permanent stream of music through loudspeakers in modern capitalism, its ritualising function in weaving the individual's affective experience into the ideologies, norms of behaviour and attitudes of the dominant societal force, is a large and important field for musicological research, even if it has thus far been largely neglected.

20. See for example *Music of the Ba-Benzélé* (Bärenreiter Musicaphon BM 30 L2303).

21. Of course, most of these observations apply to comparable phenomena in our own society too, but since there seems to be a tacit agreement amongst (ethno-)musicologists that going on academic safari is better than trying to penetrate our own sociocultural jungle (Tagg 1990), I will start by following the same rules of the game. With the initial series of examples taken 'a long way from home', I hope Western European musicologists will be lulled into feeling that we all share the same sort of 'group' identity which includes 'us' by virtue of our pointing at (studying) 'them' and by not pointing at (not studying) ourselves. Unfortunately, when we all finally return home after the initial intellectual safari, we discover that we do *not* all belong to the same group, some musicologists preferring to apply two separate sets of norms, one for studying 'them' (anthropological, social, etc.), another for studying 'us' ('let's keep to the music itself and nothing else!').

22. The main sources here are Daniélou (1968) and Malm (1967), as well as the various sleeve notes from recordings mentioned in later footnotes.

23. Here we are mainly drawing on material from the recordings *Musik från Bengalen* (Caprice RIKS LPX 7, 1974) and *Musique Indienne du Rajasthan* (Caprice RIKS LPX 1, n.d.).

intricately codified aesthetic relationships between philosophy, poetry, sensuality, colour, precise affective meanings, exact fields of paramusical connotation etc. It should be clear that the mere differences in absolute musical duration reflect different positions in class society and vast differences between the time budgets of the two classes concerned. Putting the matter as a rhetorical question, where would a hard-working Indian peasant find time to hear a two-hour performance of Raga Ashaveri — which, anyhow, should be played in the morning when he is out in the fields — with all its associations to the maidens of Krishna with their cheeks as soft, round and as succulent as ripe pomegranates?²⁴

Another time aspect of Indian classical music which might make it irrelevant for the peasant or worker is what might be called its aspect of 'meditative eternity'. Although both folk and classical musics of the Indian continent share in common a clear dualism between melody and a drone accompaniment, the drone of Indian classical musics, both Hindu and Carnatic, exhibits certain idiosyncratic aesthetic traits.

'The tampura' [string drone instrument] 'is not supposed to be 'interesting' like the piano accompaniment to a modern song but is the medium in which the melody lives, moves and has its being... it is heard before, during and after the melody: it is the ageless and complete which was in the beginning, is now and ever shall be. The melody itself, however, is the changeable character of Nature which comes from the Source to which it returns'... 'Harmony is for us an impossibility, for by breaking the solid ground on which the processes of Nature rest, we would be creating another melody, another universe and thereby disturb the peace on which it rests' (Coomaraswamy, 1957: 77-80).²⁵

Here 'Nature' and the expression of the soloist latch direct on to eternity (the 'Source'), the tampura's tones being perceived and re-enacted as a sort of metrically indeterminate sonic backcloth for melodic embroidery. This 'eternal' quality of the drone in Indian classical music is not only symbolised by its being 'one tone' sounded before, after and during the performance, but also by the fact that the four strings making up the sonic backcloth — *pa sa↑ sa↑ sa* (5-8-8-1) — should be plucked without sounding as any determinable rhythmic pattern. This quasi-recitativo, non tempo giusto, long-note musical notion of eternity or of space and time so large in relation to human size and human bodily rhythms is similar to the European and North American musical concepts of 'Wide Open Spaces' and 'Eternity' found in the stereotypes of library music, tone poems and film music (Tagg, 1991: 16-19).²⁶

Now, melody can be roughly described as the most easily perceptible and identifiable 'horizontal' line in any music. It may be regarded as the voice or part most easily memorised or reproduced by members of a given music culture. A melody is generally a singable line (*cantando*), i.e. contained within

24. For further information on Raga Ashaveri, see Daniélou (1968) and LP *Music of India – III Dhrupads* (Bärenreiter Musicaphon, n.d.).

25. This quote is unfortunately inexact because it is retranslated from a Swedish interpretation I made in 1972 from the English original, before I lost the book. The bibliographical reference should, however, be correct (noted in the Swedish teaching material for music teacher trainees in Göteborg, 1972). For similar information on the raga drone, see some of the useful quick introductions by Ravi Shankar, e.g. on LP *The Sounds of India* (CBS CS 9296). Even when the backing drone is played by wind instruments accompanying the shenai, for example, no bagpipes are used in the classical tradition; instead, several alternating shenai players are used to make the 'one continuous tone' (e.g. *Vilayat & Bismilla Khan: Duets*. Music from India Series – 1. HMV ASD 2295, 1967).

a singable pitch range, stretching over durations lasting no longer than one breath and consisting of tone beats sounded at a humanly reproducible rate. Melody can be seen as the line of individual expression in music, as the music's 'ego', so to speak. That which 'surrounds' the melody sonically, e.g. the accompaniment in Western European music (*suonando*), can in turn be interpreted as the individual's affective environment (Maróthy, 1974: 22, ff; Mayer, 1980: 263-4, Tagg, 1979: 123-4).²⁷

In Hindu raga music, as in Western European music, the individual expression carried in the melody's changing patterns of affective relationship to the drone or accompaniment is the central dynamic of the discourse. In the raga tradition the soloist should start the performance by weaving melodic statements into the drone backcloth, using a meditative mood with no explicit pulse. This initial section (*alap*) has a non-strophic, non-tempo-giusto recitativo character and slowly states the tones, tuning, mode(s) and complex of potential moods to be found in the raga, without any apparent consideration to microcosmic levels of passing time. The *alap*, occupying nearly half of the 'absolute' (linear time) duration of the performance (unless it be an *aochar*) is regarded by initiated members of the music culture as a sort of preamble (*alap* = conversation) to the performance proper which starts when musical pulse becomes explicitly externalised in the tabla part.

Drones in most Indian folk music seem to lack the meditative and 'eternal' quality of the *tampura*. If not sounded as a continuous 'bagpipe' note behind mainly strophic melodies, the Indian folk drone tends to be present in the form of rhythmic strums or other rhythmic-motoric ostinato patterns (cf. blues riffs). Moreover, *parlando* recitative performances are rarer and shorter in the folk music than in the classical music of India.

From the discussion above we might conclude that Indian folk music concerns itself more with affective socialisation of relationships to shorter, more immediate and rhythmically regular durations or patterns of time, i.e. to activities directly associated with regular movements made by the human body, while Indian classical music has a greater tendency to socialise and structure affective relationships towards longer and more abstract durations.

3.3. Medieval Europe

Similar differences between the meditative, almost static feeling of time as a vague flux with no tangible relation to regular pulse or meter at one extreme and, at the other, the more strophic, metric, tempo giusto sense of musical time, can also be found in the long process during which the liturgical music of medieval Europe developed from Gregorian plainchant, through

26. This quote is unfortunately inexact because it is retranslated from a Swedish interpretation I made in 1972 from the English original, before I lost the book. The bibliographical reference should, however, be correct (noted in the Swedish teaching material for music teacher trainees in Göteborg, 1972). For similar information on the raga drone, see some of the useful quick introductions by Ravi Shankar, e.g. on LP *The Sounds of India* (CBS CS 9296). Even when the backing drone is played by wind instruments accompanying the *shenai*, for example, no bagpipes are used in the classical tradition; instead, several alternating *shenai* players are used to make the 'one continuous tone' (e.g. *Vilayat & Bismilla Khan: Duets*. Music from India Series – 1. HMV ASD 2295, 1967).

27. The *cantando/suonando* conceptual pair is Goldschmidt's (see Mayer, 1980); the 'ego' idea is adapted from Maróthy (1974).

hymns, tropes, sequences, conductus, mensural notation, ars nova, Netherlandish polyphony, etc. to culminate in the protestant chorale (Ling, 1983: 81-116, 191-208 *et passim*). This process of gradual 'strophisation' seems to run roughly parallel to other important historical developments:

1. the confrontation of various monodic and polyphonic styles, finally resulting in the emergence of the melody-accompaniment dualism as definitive dynamic of musical expression in Western Europe from c. 1600 until the late twentieth century;²⁸
2. the establishment of the third as a consonance and the emerging hegemony of the ionian mode;
3. the crystallisation of central perspective and the figure/ground dualism in visual arts;
4. the advent of the renaissance humanist concept of the individual;
5. the long battle for power between the feudal aristocracy and the bourgeoisie, culminating in the hegemony of the latter.

It should be pointed out that this important change of strophisation in the musical time sense of the millennium 500–1500 in Europe can be traced back to the influence of popular and secular music forms on those of the aristocracy and high clergy.²⁹ As with the differences between the music of high and low castes in India, medieval European smallholders, hired labourers or artisans could hardly be expected to devote themselves to lengthy bouts of meditation or philosophy, to acquiring codified aesthetic skills or to practising the niceties of courtly protocol. *Ars subtilior* was probably even more inscrutable to medieval European serfs than sophisticated raga aesthetics to class comrades in India (remember those pomegranate cheeks). Far more relevant to the daily life of farm labourers would be music in which regularity of pulse or the subordination of pulse through metre and periodicity to movements in work and other daily activity would not only physically and psychologically facilitate the immediate task in hand, as in a work song, by providing a set rhythm for the bodily movements and an emotional framework suited to the actions, but also be able to reflect and emphasise the rhythm of the individual's day-to-day existence in society (microcosmic and macrocosmic durations). Thus it seems reasonable to hypothesise that in the same way as structures of feudal power and tenets of medieval ecclesiastical dogma became inefficient and ultimately unacceptable obstacles in the upwards path of the merchant class, most of whom had risen from peasant and artisan origins, so the affective experience of eternal swayings, the harmony of the spheres, melismatic alleluias, etc. became increasingly irrelevant to that same section of the population. What would be required was music conceived in regular pulse, meter and periodicity, for this would tally better with the practice of meeting at given hours in given places to exchange goods and with the need to abstractly quantify the value of work. Most of all, such music would rhyme better with a new experience of time passing, as well as with the age-old feeling of working movements. Furthermore, such music would permit an explicit communication of the affective hierarchisations of the regular patterns of duration found in working operations, daily routines, manufacturing labour, etc.

We could in fact say that the dominant view of God underwent some radical

28. For discussion of the 'decline of figure and the rise of ground' with reference to the music of the rave scene, see Tagg 1994a.

29. Ling (1983): 113-115.

changes during this time. There seem to be two main stages in this process. The first takes us from the monodic, flowing, metrically irregular, non-strophic and additive sorts of melodic statement to the combination of several melodic lines building a 'vertical' sound experience in regular pulse but seldom with regular meter or periodicity. The second change takes us up to the melody/accompaniment dualism, where polyphony and tendencies towards irregular periodicity have been superceded by one melody and its background, all in generally regular pulse, meter and periodicity. God is no longer musically viewed so much in terms of eternal flux seen through the eyes of a leisured meditator, he has become much more the god of clocks and machines, the personal 'here-and-now' experience of men or women (mostly men) with regular, recurrent patterns of work, routine and of keeping (linear/clock) time.

3.4. *Europe after 1600*

The standard bourgeois European musical time sense is, in general, that of the clock; i.e. it is based on regular recurrences of pulse, measurable in beats per minute. This principle is of course applicable to many kinds of music, the temporally distinguishing features of most European music after 1600 being that it is organised in recurrent series of multiples of either two or three beats in a row and that the duration separating accentuated tone beats is constant and regular, i.e. the music is usually in regular duple, triple, quadruple or sextuple metre. The simultaneous occurrence of more than one meter (polyrhythm) or the frequent change from one metre to another (resulting in asymmetric isometre, additive rhythm, etc.) is rare. The regular metre (bars of identical duration between accentuated tone beats) is in turn subordinated to a structure of musical phrases and periods which usually consist of a binary multiple of bars, mostly four or eight. These 'breathlong' durations are in their turn organised into sections which usually encompass a quaternary multiple of phrases or periods. Such regularity and congruence is the backbone of our musical time tradition and can be seen in practically any European classical or popular form, from the minuet, jig, waltz and rondo, through the 32-bar standard evergreen chorus to polkas, the 12-bar blues and most pop songs.

A general rule seems to be that the more the music is used in connection with bodily movements (dancing, working, marching, etc.), the greater the probability there is for regular tempo, metre and periodicity to be in evidence. This is, however, a dialectical relationship in which music can both influence and be influenced by, both reflect and alter the affective experience of time. This is illustrated by the following example.

3.5. *Country and Urban Blues*

During the 1920's and 1930's, a large number of African Americans moved off the cotton plantations in the southern USA to take up assembly line work in the large industrial cities of the mid-west: it was a mass movement from slavery and serfdom to underpaid proletarian labour (Oliver 1963, 1969; Rowe 1973). The strong traditions of rural music which these US-Americans took with them underwent a number of changes. The 'country blues' was acoustic: urban blues finally became electric. Country blues often took the form of communication between the individual and him/herself or between the performer and another individual or a small group: urban blues used mainly a group-to-group or group-within-itself mode of communication.

Country blues was rarely used for dancing: urban blues frequently had such a function. Country blues was performed in a quiet 'hi-fi' rural soundscape: urban blues sounded in a loud 'lo-fi' industrial environment (Schafer 1974, 1977; Tagg 1994b). Country blues had an AAB thematic structuring of periods which could be performed as phrases of varying length (e.g. $4 + 6 + 4 = 14$ or $5 + 4 + 4 = 13$), whereas the various styles of urban blues were performed in symmetric $4 + 4 + 4 = 12$ bar periods.³⁰

This development can be commented in two ways. On the one hand we could say that in changing their rural traditions in such a way, black southerners were influenced by experiences of time and new feelings of movement and space in his new environment. Having to live in a foursquare tenement block, take the bus or train at specific clock times through the right-angled grid of the city streets to the rectangular factory building where rectilinear assembly lines moved at a regular rate and machines made metronomically regular noises, having to clock in, clock out, travel back home at another given time past traffic lights, through grid streets again, the African-American working immigrant required music which would reflect this new life at an affective level of perception.³¹ On the other hand, we could say that performers or listeners could be preparing affectively for the rhythm and sounds of the life they have to lead in an attempt to master it on an emotional level.³² Just as the meditative God concept must have been pretty meaningless to the up-and-coming merchant in renaissance Europe, so the fluctuating periodicity and pulse of country blues seemed less relevant to the young black city dweller of the 1950s and 60s (Haralambos, 1974). Similar observations could be made about the replacement of the more fluid type of evergreen ballad with its lack of bass and drums clearly pounding out the 'sound of the city' by rock and roll, which was so greatly influenced by various styles of urban blues (Gillett, 1971).

In this case it seems fair to draw a parallel with the caveman's bison in the Dordogne. The hunter has painted his presumptive prey with his arrows symbolically stuck into it. He has emotionally prepared himself for what he hopes will be a successful kill and at the same time has recreated the affective experience of having done a similar deed before.³³ Thus, it could be said that urban blues or rock and roll performers or listeners simultaneously prepare for and work through, at levels of socially structured affectivity, important everyday experiences in their environment. Included in these experiences are of course a feeling and a perception of time as expressed by the clock, by mechanical movements, by the soundscape and the relation of these to the internal bodily time patterns of the individual.

30. The regular 8 or 12 bar blues patterns can of course be extended to 16, 24 or to other similarly quaternary lengths.

31. See, for example, explicitly urban blues such as Joe L Carter's *Please Me Foreman* ('won't you slow down the assembly line some' ...). This track, recorded from Swedish radio in 1973, is on the Classic label.

32. This process became particularly clear to me when, faced with having to explain the impact and popularity of rock and roll to psychologists convening (1981) in the modern Göteborg suburb of Frölunda, I asked them to step outside into the urban soundscape and to position themselves at 10 metre intervals from each other behind the tower blocks by the bus station. This, I claimed to them, would help explain the genre's relation to the individual and his soundscape. Once outside, they agreed that the experiment would not be necessary and that they would have to shout over the traffic noise to make themselves heard.

33. For prehistorical musical equivalents of this visual magic, see Ling (1983): 7-11.

4. Time sense and music in modern capitalism

4.1. 'Absolute' and 'relative' time

It is clear that clock time (linear, 'absolute' time) is the dominant time sense in our society. However, there seems to be a need in current musical genres to correct and subvert this idea of time (see 4. 2., 4. 3.). Here we return to the distinction between linear ('absolute') and cyclical ('relative') time, the former being objective according to the criteria of Newtonian physics, the latter according to those of social science. Relative time can be observed objectively through the use of music. If you play the same set of differing types of music to a variety of respondents, asking them to estimate how much (linear) time has elapsed while listening, you usually find intersubjective agreement that fast pieces tend to be judged 'longer' and slow pieces 'shorter' than they 'actually' are.³⁴ This is the same sort of consensus that says that time flies when life is fun, that it drags when life is a 'drag'.

Such socially objective examples of relative time sense are not uncommon but are not officially conceptualised in our society like clock time. It would therefore seem reasonable to assume that relative time experiences will find appropriate expression in music, especially if we agree with the definition of 'music' offered at the start of this paper. It would moreover seem natural that all types of time sense, from microcosmic to daily, monthly, yearly, perhaps even generational rhythms, should be communicable through music so that changes from static to dynamic, from irregular to regular, quick to slow, empty to full, sudden to gradual, rough to smooth and the rhythms all such changes create, should be communicable through the same mode of expression — through music. However, assembly line work, clock slavery and the digital quantification of practically all values in our society do not encourage such rhythmic/periodic fluctuations of the human spirit in relation to time. These natural fluctuations need therefore to be catered for by subversion of clock time during leisure and by its manipulation during work. Let us see how this works.

4.2. *Rock and disco*³⁵

In rock and most pop music, the bass drum and bass guitar are responsible for stating clock time (explicit pulse performance), the bass drum generally playing every or every other pulse beat, the bass guitar emphasising every fourth one. In rock, however, this general rule can be, and often is, altered by syncopation. Pulse beats can be missed out and strong beats in the metre anticipated by either half a beat, one beat or even two beats, this causing agogic effects which pull the now implicit metronomic beat (forwards in terms of perception, backwards in terms of the unidimensional time flow expressed in the left-to-right layout of notation). Over this already slightly humanised version of metronomic pulse and clock time there are cymbals, hi-hats, rhythm guitars, keyboards and other accompanying instruments which

34. This I was able to observe by asking students not previously instructed to do so to assess the duration of pieces heard during analysis classes. I regret not having recorded the results of these somewhat spontaneous experiments, but assure the reader of their viability.

35. This point is highly generalised and merely points to a few imaginable tendencies. For some types of disco (e.g. funky) and rock (e.g. symphonic synthesised rock), the traits described here may well be inapplicable. Some of the ideas presented here initiated from a conversation I had with Dick Bradley (see Tagg 1980).

often perform riffs at microcosmic loggerheads (out of phase by a quaver usually) with the beat (pulse). These riffs create a complex weave of rhythms making patterns of coincidence/non-coincidence with each other and with the bass drum and bass guitar. The time sense coded in the accompaniment is thus further stylised and humanised. On top of all this comes the melodic line, be it the vocalist, lead guitarist, saxophonist or other instrumentalist. Their melodic statements (phrases) are embroidered with further divergences from clock/metronome time against the already subverted pulse of the accompaniment.

This simplified and somewhat abstract description of what happens in rock rhythm gives us a clue as to how the clockwork beat of mechanically regular time can be expressed (recreated, reflected) as a sonic experience by members of the community who must live by it. However, this expression or reflection of time is a highly creative and interpretative social and cultural phenomenon in that 'normal' timekeeping is made to jump, twist and turn: it is pulled hither and thither and converted into a socially acceptable revised version of the dominant time sense, a phenomenon over which the users of the music have no control at work or in other official realms of power, but over which they can gain some control through its expression in music. Over this social consensus of altered and re-controlled affective time, the singer/lead guitarist/soloist yells/wails/screams loud melodic phrases which can be consistently out of phase with the implicit or explicit metronomic beat,³⁶ but which are nevertheless containable within larger units of durational recurrence (e.g. periods of 4, 8 or 12 bars). It is like the caveman and his bison again: sticking pins into a picture of someone you abhor or arrows into the bison is an affective process of symbolic appropriation similar to the remoulding of clock time and mechanical rhythms into those of human pulse, footsteps and breathing which vary in intensity and rate.

In disco, on the other hand, as in most techno/dance-related music, there is not the same extent of subversion of clock time, not the same human degree of appropriation of mechanical pulse. True, the constituent tracks of a disco or techno piece are performed in ways comparable to those of rock and roll, but the metronomic beat (often actually recorded to metronome) — and this is the most important point — is almost never absent from the bass drum track.³⁷ Moreover, although at first sight many aspects of disco or techno music's rhythmic texture may seem highly complex, these rhythmic patterns are probably not so much subversive as subordinate to the beat. This is because disco and techno syncopations, unlike those of rock, appear mostly to be containable within a one- or two-beat duration, seeming to be based on semiquaver or quaver anticipations rather than those of quavers or crochets. There is no room here to explore this question in detail, the whole matter requiring further study. However, one might hazard the hypothesis that disco represents a higher degree of affective acceptance of and identification with clock time, digitally exact rhythm and hence with the system in which this time sense dominates.

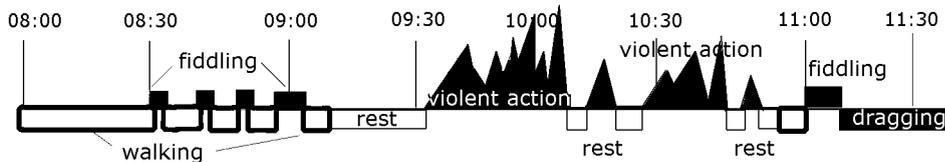
36. A good example of this phenomenon is Mick Jagger's rendition of *Paint It Black* (Decca 1. 12395, 1966) in which he is consistently one quaver before the beat during the first 8 bars of every reprise.

37. I have never attended a professional disco recording, but Bob Lander, professional sound engineer (Göteborg) and member of the Spotnicks, assured me in 1976 that disco backing tracks were often recorded to metronome. (Predates sequencing and quantisation!).

4.3. Music and work situations

It should also be possible to study the communication of time sense in advanced capitalism by reviewing the phenomenon of Muzak™.³⁸ However, let us try first to polarise the question by comparing a typical 'Muzak' work situation with an extremely 'non-Muzak' series of tasks.

Fig. 1 The hypothetical prehistorical hunter's morning



Let us assume you are a prehistoric hunter and gatherer. Figure 1 schematises your hypothetical morning of work between 0800 and 1145 hours, according to the clock time we live by but which you have not even dreamt of. You get up when the cockerel or the sun tells you it is 'time'. Before leaving your hut, hovel or tent, you eat, drink and do other morning chores. Then, when our clock shows 0800, i.e. when you feel ready, you walk off to the woods where you left your traps the day before. It takes 30 minutes of our time measurement (several thousand paces or the passing of certain points in the natural environment you walks through) to reach the point in the forest where you find the first trap. (It is now 0830). You disentangle pieces of wood with fiddly finger movements, perhaps you also gut and skin rabbits or other small animals caught in various traps; then you put the catch into your bag. By the time this precise sort of work is finished (0915) you realise that if the sun is at that height in that direction at this time of the year, there is a likelihood that deer will be moving to graze in a certain clearing in the neighbourhood. You move over there and lie in wait for sometime before (0935) preparing your bow and arrows, jumping up, running, aiming, missing, trying again and finally perhaps shooting one. This more violent and sudden type of activity recurs four times before you decide you need a rest (1005). Behind the tree you lean against, a squirrel is scurrying about. Your adrenaline rush has not yet subsided and you try to club the small animal to death (1015) but give up as it scuttles up to a high branch. Later on (1025, 1035, 1040, 1049) you take a pot shot at a wild boar, two wood pigeons and another deer but miss all except the deer. You rest again for a short while (at 1045) after which you tie up the legs of the deer you managed to kill and (at 11.10), when the sun is hot and you feel quite tired, you drag the catch into a safe place nearer home where you can eat and take a well-earned rest. You leave the animal there for a few hours while you collect berries in the afternoon and you drag the carcass back your hut/hovel/tent before nightfall.

38. By 'Muzak' is meant not only the New York company of the same name, but any music specially recorded for the non-entertainment purposes of increasing productivity in places of work and consumption in shops, etc., i.e. the sort of low-profile, low-volume wallpaper of sound generally referred to as 'functional music' (as if no other musics had functions!), 'environmental background music', etc. and produced by such firms as Muzak, 3M, Philips, etc.

Fig. 2. The accounts department terminal operator's morning

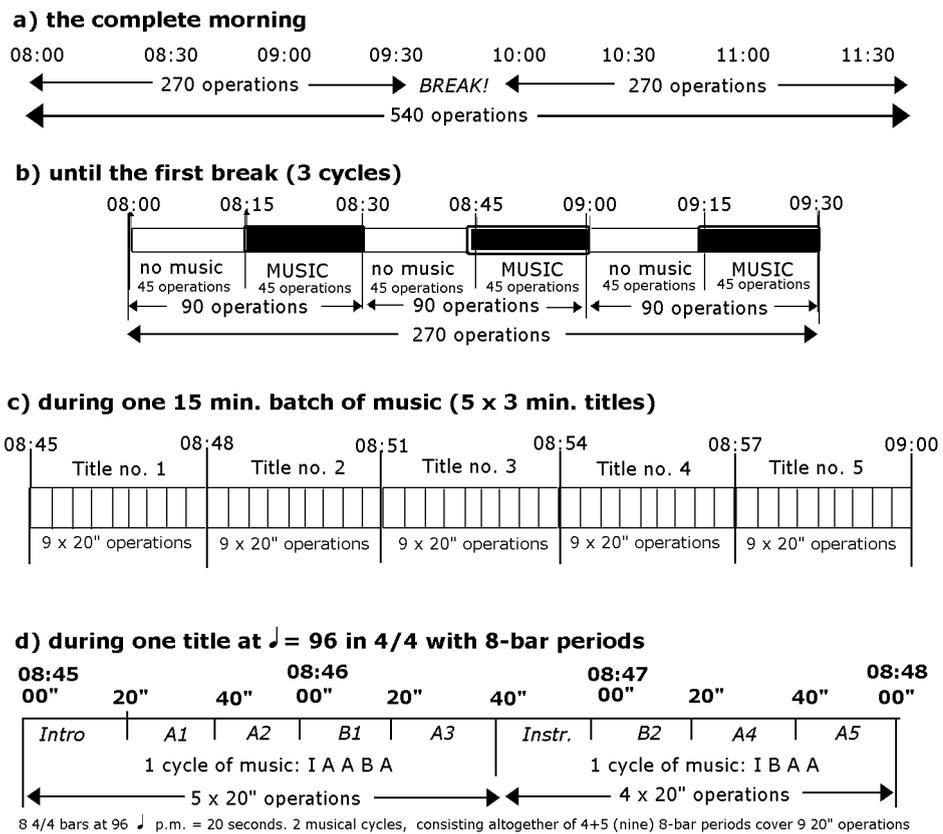


Figure 2 symbolises your morning's work as a fictitious accounts department terminal operator. However, before you clock in at 8.00, you have been exposed to rigorous bouts of sonic time structuring. Firstly, as your digital bedside clock shifts silently from 5.59 to 6.00, you are woken out of your slumbers by 2'45" of morning news. Bombarded by soundbytes about unemployment, massacres, stock markets and football results, you go to the bathroom while the cheerful radio DJ reminds you it is 6.12, serving you a tirade of jingles and adverts for pointless commodities, followed by three-minute batches of rhythmic and melodious music, telling you it is 6.15, 6.19 and so on, every now and again reporting ritually on traffic and the weather. To the strains of middle-of-the-road pop and inane wittering from your DJ, you eat breakfast and make other necessary preparations for the day ahead. At 07.10 you switch off the radio, just having heard the same atomised and dissociated items of news for the third time, a weather report for the fifth time, traffic news for the fourth and a time check for the ninth time. Your time sense has already been preened into neat durations of 4–8 seconds, 18–35 seconds, one minute, 3 minutes, 20 minutes and 30 minutes, all recurring cyclically (Karshner, 1972: 101, ff).

You lock the apartment door, go to the car, unlock it, get in and switch on the ignition. As the motor splutters to a start, the car radio tells you it is 7.17, that the weather will be bright with rain spreading later from the west and that here comes the latest number-one hit. It takes you twenty-five minutes to drive to work, during which time you hear another five batches

of music, chat and time checks, while you rev up, brake, slow down, change gear, overtake, negotiate bends, look left and right, avoid children and dogs, pull up and move off from traffic lights, etc., before you finally park the car and switch off the ignition, thereby silencing the radio. You lock the car, walk into the building, take the lift up to the sixth floor of the insurance office, clock in, say 'good morning' and ensconce yourself at 8.03 in front of your computer terminal.

By 8.06 you have started keying the first pay slip. You turn to a new piece of paper every twenty seconds and continue to key in figures and more figures at a similar rate for 15 minutes (see 08.15 in figure 2b), by which time your mind has started wandering. At 08.15 pleasantly melodious and soothing music starts exuding from a myriad of small loudspeakers concealed all over the false ceiling of the office. There are no words, just pleasantly hummable strings of tunes. It is not loud and after 8 or 16 bars, you pay it no more attention. You do not notice that it disappears at 08.30 or that it returns at 8.45. In any case, you take a break at 9.30. You finally get to change position, rhythm and talk to workmates before resuming your tasks at 10.00. By lunchtime you have keyed in another 270 bills, invoices, etc. and heard another 45 minutes of soft music, served in three 15-minute segments of five three-minute titles each (fig. 2b).

The relationships between work operations and the passing of the morning's time are obviously highly different during these two hypothetical mornings. For the hunter, work is firstly divisible into longer operations (walking, checking traps, stalking, fiddling with small objects, dragging — see fig. 1). Secondly, the hunter's morning consists of tasks requiring highly diverse frames of mind, paces, postures, amounts of energy, in short a variation of affective states (compare walking with taking a rest, lying in wait with actually attacking, carrying or dragging with fiddly finger work). The hunter also moves and works in a constantly shifting physical environment. Thus, the hunter's morning consists of perhaps four or five effectively distinct tasks.

For the terminal operator on the other hand, the morning consists of 540 practically identical operations, requiring the same pace, the same posture, the same amount of bodily energy, using the same muscles in the same environment (fig. 2a). This clerical worker's tasks provide no variation of affective states and, like the assembly line employee, you have to be provided with some means of unconsciously structuring time into effectively experienceable proportions.

The Muzak™ people seem to be fully aware of the problem. Firstly, they recommend for assembly line work that their music be played in 15-minute segments interspersed with 15 minutes of no music. This is no more than Pavlovian trickery by which musical absence signals musical return. It is also a means of structuring the first 90 minutes of repetitive work into three clear durations, all at an unconscious level of perception, i.e. as three half-hour cycles of 'no music then music' or vice versa (fig. 2b). However, this macrostructuring of passing time is hardly sufficient, for even inside one of these half-hour cycles consisting of music followed by absence of music the terminal operator might have to perform 90 more or less identical work operations (fig. 2b). Deeper structuring of passing time can then be achieved by playing a sequence of different titles, each lasting three minutes, this length being a familiar duration for 'pieces' of much popular music.

Fig. 3. Hierarchy of durations: computer terminal work, music, biocycle

Operation	Musical measure (examples)	Duration	x ± ⁱ	See fig.	Human biocycle ⁱⁱ
	1 surface rate, ♩ @ ♩ = 73 or 1 ♩ @ ♩ = 156	0.00.01	7.5		1 bioelectric nervous wave
	1 pulse, beat ♩ = 106	0.00.075	4		1 heartbeat complex
1 head movement	2 bars 4/4 @ ♩ = 120	0.00.03	3		1 ventilation
1 arm movement	4-bars 4/4 @ ♩ = 96; 1 very short advert	0.00.10	2		1 blood circuit flow
1 operation	8 bars 4/4 @ ♩ = 96; 1 short advert	0.00.20	3	2d	
3 operations	24 bars 4/4 @ ♩ = 96; 32 bars 4/4 @ ♩ = 128; 1 long advert; 1 TV title sequence; 1 sonata exposition	0.01.00	3	2d	
9 operations	1 pop song or short classical movement	0.03.00	5	2d	2 metabolic oscillations
45 operations	1 batch Muzak™ music (or no music); 1 sonata or short symphony	0.15.00	2	2d	1 endocrine osc. ^b (5-16 mins)
90 operations	1 Muzak™ segment; 1 long side of a vinyl album	0.30.00	3 (4)	2c	1 gas exchange osc. (33 mins)
1 work period	3 Muzak™ segments; 1 concert; 1 C90 cassette's worth of music	1.30.00	4	2c/2b	1 metabolic fuel osc. (1.3 hrs.)
½ a working day	1 long opera; 1 short recording session	4.00.00	2	2b/2a	1 heat balance osc. (3 hrs.)
1 working day	1 long recording session	8.00.00	3		
1 day + night		24 hrs.	3.5		1 circadian rhythm
		3.5 days	2		1 water cycle
1 work cycle		7 days	4		
1 month		30 days			1 long-range endocrine cycle

i. This column displays the factor by which you have to multiply the duration shown immediately to the left in the current row in order to arrive at the duration shown in the column diagonally below and to the left. For example, there are approximately 7.5 bioelectric nervous waves for every heartbeat complex, 3 heartbeat complexes per blood circuit flow, etc.

ii. osc. = oscillation. Rates in this column are taken from Young (1988:36).

Having now decreased the number of work units per unconsciously experienceable/emotional duration from 270 (between clocking in and the first break) to 90 (between recurrences of a 'no-music-then-music' cycle or segment) and by cutting the operation-to-affective-time-cycle ratio further down from 90:1 to 9:1 (between the starts of two consecutive musical titles), it is now possible for the assembly line worker or computer terminal operator to feel the passing of time as cyclical (fig. 2c). However, the hierarchisation of affective time can be carried a step further towards connecting

up the microcosmic durations of heartbeat to arm movement to unit of work. The computer terminal operator's 20-second work unit corresponds roughly to two musical phrases performed at an easy tempo (e.g. 8 bars of 4/4 time at 96 bpm — fig. 2d). This means that, taking the example of a standard pop number with the thematic/formal order of events Introduction – A – A – B – A – A – B – A (see fig. 2d), (1) each operation corresponds in duration to eight-bar segment of the song; (2) reprise of A(+A)+B+A occurs after less than six operations. This means that cycles of affective change have been reduced to manageable proportions (3:1), from the microcosm of the heartbeat to the complete working day, as listed below and as shown in figure 3 (p.19).

- 4 heartbeats (0.75") = 1 head movement (3")
- 3 head movements = 1 arm mvt (10")
- 2 arm movements = 1 operation (20")
- 3 operations = 1 musical reprise (1 min.)
- 3 musical reprises = 1 piece of music (3 mins.)
- 5 'pieces' = 1 batch of music (15 mins.)
- 1 batch music + 1 batch no music = 1 segment of Muzak (30 mins)
- 3 Muzak segments = 1 half morning (90 mins)
- 2 half mornings = 1 morning (210 mins)
- 1 morning + 1 afternoon = 1 workday.

In light of these considerations it is not difficult to understand why music has become such an important part of our everyday life, though it is still often considered, if considered at all necessary to our culture, as an intangible and troublesome matter, to be shelved in the entertainment and leisure department of our schizophrenic public conscious. Here we separate work from leisure, public from private, collective from individual, rational from intuitive, serious from frivolous, heavy from light, fact from fiction, business from culture, natural science from the humanities, etc. as if 'never the twain' of these spurious opposites 'should meet'.

5. Bread, circus, time, motion and mental space

From the examples and discussion just presented, I have sought to explain how, and to a certain extent why, time sense can be expressed in a variety of ways through music. One such variation of particular importance was that related to questions of class.

Now, mentioning the situation of the culturally privileged and filthy rich maharajah in virtually the same breath as that of the prehistoric hunter and today's computer terminal operator may seem silly, but with the potential for liberation inherent in our advanced state of industrial production there is no *logical* reason why reflective types of cognition — hitherto mainly the preserve of a privileged elite — should not be available to *all* members of society. The obstacle to such democratic access is of course that, under capitalism, benefits derived from increased efficiency in the work place are squandered to make the rich richer and the poor poorer. This mass impoverishment also means disenfranchisement from the world of work (unemployment being the most obvious symptom in Europe or North America) and, consequently, dissociation from those aspects of community (including a sense of self) that derive from active participation in material production or in provision of services. This type of social exclusion, clearly abhorrent to

those suffering directly from it, is also dangerous to guardians of the very system causing that misery because the personal dissatisfaction of many individuals, if reflected upon and organised, can turn into collective dissent that threatens the system.

One of the more effective ruling class responses to this kind of threat has been to provide the populace with 'bread and circus'. Assuming, perhaps naively, that the social services in many of today's industrialised nations have yet to be *totally* dismantled, i.e. that only a small minority of our citizens actually starve to death (the 'bread' factor), threat of organised popular dissent is also effectively counteracted by reducing opportunities for reflective thought through the provision of constant entertainment in which music plays an essential part (the 'circus' factor). By allowing a certain amount of popular dissent into today's media 'circus' — rarely into parliaments and never into the boardrooms of transnational corporations where the 'bread' decisions are taken —, the system can present a populist face. This populism is of course compounded by the marketing myth that the commercial media circus 'gives people what they want', such notions persuading us to identify *with* the system instead of fighting it. The opportunities to 'belong' are numerous and contradictory, as the following four examples illustrate.

1. Professional football (soccer) has recently, in the UK at least, become increasingly popular as commercially exploitable local tribalism that paradoxically relies on an increasing internationalisation of the game.³⁹
2. The status of identity construction through commodities advertised in the commercial broadcast media remains virtually unchallenged despite the greater expense that such advertising involves for the public as consumers and as media audience.⁴⁰
3. Communities of taste are constructed and exploited for product targeting through format radio programming despite the dubious ethics related to such division of the population.⁴¹
4. Commercial radio programming continues blindly to follow the 'no dead

39. For example, it is interesting to note that support for Liverpool FC and Everton FC seems to have increased in tandem with the proportion of players imported from areas that must be qualified as anything *but* local (e.g. Scandinavia, Croatia, Italy, Brazil).

40. Public broadcasting companies either must not or do not have to make a profit. However, commercial broadcasters have shareholders who, without lifting a finger, want to see their annual dividends increase. Commercial broadcasters are therefore obliged to make a profit. This profit (the difference between pay-outs to shareholders in commercial broadcasting and breaking even after reinvestment in public broadcasting) has to be paid for, and so do the expenses incurred by companies choosing to advertise in the broadcast media. Advertising time and advertising agencies are not cheap. Who pays? We, the public, pay more for goods and services from companies advertising in the broadcast media because profits must be made for shareholders of companies who advertise on broadcast media as well as for shareholders of media companies who derive income from advertising: there are many parasites to feed.

Another ethical problem concerns democracy and the commercial broadcast media. While we have, at least in theory, the right to influence public broadcasting policy — what should be broadcast, how it should be financed, etc. — by means of public debate, there is no way in which we can influence manufacturers of cars, cola, detergent or tampons to stop advertising and to reduce their prices to the public by the 10-20% that marketing costs occupy. Nor can we counteract commercial broadcasting's crass adherence to media demographics, target groups and the division of society into constructed communities of consumer taste rather than into group identities relating to real cultural and economic class interests.

For more on the myths of 'free' radio and 'we play the music people want to hear', see Karshner 1972: 91-126 and Rothenbuhler 1987.

air' aesthetic, thereby exacerbating irrational fears of silence and solitude, encouraging mental agoraphobia, and cultivating contempt for contemplation.⁴²

It should be clear that contemplation and reflexivity are essential to the understanding of relationships between self and environment, both social and natural. If practised in a non-escapist fashion, contemplative types of cognition are also a prerequisite for insight into basic problems of human existence, e.g. war and peace, hunger and riches. Moreover, without the necessary *recreation* which a certain degree of mental stasis can help provide ('recreation' in the Marxian sense of the term, including the notion of recreating the conscious) I do not think we are capable of coping with the rhythmic dynamism required of us by advanced industrialised society.

The counterargument to the view just presented is of course that the hectic pace of life we have to lead needs to be asserted, restated, recreated, expressed, subverted, appropriated or otherwise treated at affective levels through music so that we can get a handle on its emotional characteristics, celebrate it, criticise it, etc. Indeed, we would not survive the turmoil of these times without the ability to appropriate and treat our experiences in such a way. The problem is therefore not *that* we indulge in the necessary creative appropriation of speed and stress but that such appropriation seems to be almost the *only* currently available musical, sonic and choreographic treatment of the ailment: it is as if silence and stillness, calm and quiet were all banned from the popular media. DJs, broadcasters, advertisers, publishers, record companies, managers, assessors, clients, etc. all seem to recoil in stunned shock at the notion of anything or anyone taking a long time: it is almost as if they saw that time and the space it provides us with as an excuse for laziness or as a threat.⁴³ But such mental space of peace and quiet, free from the slavery of clock time, devoid of social metro-

41. The advent of format radio in the USA is described by Denisoff and Peterson (1972:5) in the following terms.

'Concerned by the Nazi and Stalinist use of radio and movies for state propaganda in the 1930s, a number of scholars turned to look at the impact of the mass media on society. Krenek, Blumer, Adorno and Lasswell' [1938-41] 'were soon joined at Columbia University by Merton and Lazarsfeld who founded the Office of Radio Research which became the Bureau of Applied Social Research. They, with their students, did a whole set of studies on the media industries, their program content, and effects on their audiences' [c.1942-50] ... 'Ironically, what began in the 1930s as a concern with totalitarian political propaganda became, by the 1950s, the intellectual fountainhead of "motivation research" — the prime tool of Madison Avenue advertisers.' See also footnote 40, paragraph 2.

42. See Karshner 1972: 91-126, Rothenbuhler 1987.

43. I tried to illustrate this point in a series of six fast-moving twenty-minute music education programmes for Dutch national radio (*Muziek maakt alles mooier*, AVRO, 1988, for pupils in the 11-15 age range). I included the recurrent spot 'This Week's Silence' during which children from one school asked the audience to think about topics ranging from someone's dog dying to why so many children in the world are starving. Each announcement was followed by silence. Initially, the traditional 'one minute's silence' seemed the best option but Gerard Kempers, my friend the producer, quite reasonably felt that broadcasting silence for one minute out of twenty was excessive. We cut the broadcast silence down to thirty seconds, only to discover that a control room alarm would go off if silence were transmitted for more than ten seconds. We cut the broadcast silence accordingly. Even then, we had to put large stickers on the broadcast tapes, to warn the engineers that the ten seconds of silence contained in each programme was intentional. So great, it seems, is the taboo of silence in radio that we were not allowed to broadcast more than 10 seconds of it, not even for educational purposes in programmes created with the explicit purpose of increasing public awareness of the functions of sound, music *and* silence.

nomes, is essential to our survival: it provides rest and recreation and is vital to our creative thought processes. Without it there is no way in which we can rebound, recreated and in possession of our own souls, into the mindless stress that poses as normality.

All this neurotic movement and impatient sound strikes me as an intrinsic aesthetic ingredient in the rites of the capitalist religion of commodity fetishism. Here the high priests are all young, they are 'now people', here today and gone tomorrow.⁴⁴ All those privately owned but publicly disseminating media corporations still cram one action-packed time-waster or glitzy game show after another into an interminable 'go go go' that generates a perpetual present time in which advertisers tell us to call in with our credit card details 'now!' and to post the coupon 'today!', all while video sequences are cut from pillar to post as the beat goes on at a minimum rate of ♩ = 116. All this ostensibly uncontrollable noise and movement drowns and suffocates natural human tendencies (remember the bison)⁴⁵ to reflect upon, to understand and to restructure our own experience (including that of time); it inhibits democratic control of our social destiny by using partly seductive, partly brutal, hypermaniac sounds — music and messages which may be intended as 'fun fun fun' but which black out John Cage's 'window of silence', the only vantage point from which we can review the sounds and movements in time and space around us.

In some parts of advanced industrialised society, changes in the musical tastes of young people seem to indicate a rejection of the pseudo-dynamic brainlessness portrayed above. According to Golovinsky (1980: 236, ff.), lyrical Baroque music and qualities such as 'stillness' and 'harmony' in music were highly rated by young Muscovites, particularly significant scores being noted for respondents from totally urban backgrounds.⁴⁶ The more recent popularity of various forms of ambient music strongly emphasise this trend.

I do not mean that a return to the meditative spirit will solve the problem of emotional survival under monopoly capitalism, let alone guarantee the continued existence of human life. Ever-increasing monopolisation will, unless we suddenly experience a new type of socialist revolution on a global scale, lead to increased alienation of labour, and many groups of people — not least the young — will sorely need music which firmly expresses a stand against all the stress, mania, noise, time slavery, etc. that symbolise the political power over which we have no apparent democratic control. However, neither the static meditation of the lyrical Baroque or Hindu raga nor the hyperdynamic involvement of industrial techno can alleviate the psychosocial plight of the alienated individual under advanced capitalism. Social science and the humanities have still a long way to go before we can provide a stringent analysis of the mechanisms connecting, on the one hand, individual feelings and the cultural expression of groups and classes with, on the other hand, the socioeconomic realities in which such cultural expressions are created and used.

44. I first wrote this sentence aged 39. Aged 53, I still agree. I still agree (aged 56).

45. See p. 13 (para. starting 'In this case'...) and p. 15.

46. My Russian is practically nonexistent, but this is the gist of the notes I made during the talk, translated into German, which Golovinsky gave at a symposium of popular music researchers from what was then socialist Europe in Geltow (GDR) in May 1983.

One thing seems nevertheless clear. As the wheels of the capitalist machinery eventually grind to a grim halt, the *real* cacophony of unemployment, injustice, class struggle, oppression and alienation will become louder and louder. The sound and movement drowning this cacophony will also need to increase volume and tempo proportionately. The doses of seductive, commodity-fetishist opium and the amounts of anti-socialist propaganda will also need increasing. These will all be rearguard actions in which music, including its communication of time sense, will play an important part. The obvious question is: what can we musicologists do about all this sonic, economic and ideological chaos and injustice?

Personally I think we might do well to start by following the example set by Ling (1983) in his Swedish language history of European music and try to connect the affective, tactile, corporeal and emotional activities of making and using music as meaningful sounds with the social, economic, cultural and anthropological aspects of the society in, for and as a result of which those sounds are produced. In this way we might be able to decode the implicit ideologies, socialisation patterns and norms of behaviour in our own society and take concrete, collective and political steps to change its direction. Charles Hamm (1982:4) put the matter quite clearly:

‘If one had been truly, attentive ... to trends in the mass dissemination of music in America... one could easily have predicted the outcome of the 1980 presidential election and anticipated other events in the United States signalling a massive swing to the right, politically and socially’.

It is in other words high ‘time’ for musicology to come of age, to emerge from its nursery closet of elite-scholastic party games and to go out on to the proverbial streets. This means treating music as if it actually meant something to ordinary human beings and treating the people whose creation of surplus value ultimately gives us our work and livelihood with the respect their work and life rightfully demand.

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