elaborate level, how people do somehow manage to work out a compromise between the more natural cycles and the more external artificial cycles which Western society of course brings out.

It was interesting to me while I was doing this film I am working on in the mountain valley to find that the farmers there, living mostly above 1,000 meters, 1,500 meters, up to 2000 meters altitude, were quite aware that their sense of time was different from the city people's sense of time. They started becoming aware of the fact that they did resent the colonization, the rhythmic colonization coming from town, and they had the capacity for tuning in to natural cycles. They didn't use those words, but spending time with them, interviewing them and filming them, was an important experience to see that these populations who still, to a large extent, work with their hands — out there farm work is not done so much by machines because it's very steep — still rely on their own perceptual capacity which has nothing to do with our paper made schedules in cities, industry and so on.

MW: How did they articulate the difference in their perception of time and the city/industrial perception of time?

AM: It starts at a very practical issue — we could call it a political issue — of their holidays. In the old days when each little place lived in a segregated way, they had to develop a certain form of calendar which suited them and had to do with their particular cycles of work. This didn't present them with any problems because of course nobody else would ever dream of telling them to not observe their holidays, or not do certain things at certain times. Now, of course, with part of the population having to commute to work, to town, the children having to go to school in another village, and the tourists coming in the summertime, much of the traditional calendar is threatened, or is almost on the verge of becoming extinct, you could say.

I tried to show this graphically over a year; for 365 days I just plotted their holiday distribution compared to a modern working schedule of 5 days a week work/ 2 days a week off; then one month straight vacation. Of course, theirs is much nicer because you have holidays all over and it creates quite a variety of patterns. What I shall do then is make it also into a wave form that you can see in the film, and in audio so that you can hear the difference between the assymetrical pulse wave and the very rich wave. Visually, this is much nicer than just having a square, up and down.

They were very responsive to that. I talked to farmers whose families have lived for generations on this same spot way up there, and it comes out that they know every corner of the space: They know that if it's warm one place, it doesn't mean that everywhere it's really warm; if the earth somewhere has some sort of strange behaviour, it doesn't mean that somewhere else it's the same. They know all the little differences. And the same with time. They have still lots of references with synchronizers in nature; the animal behaviour, observing little elements in temperature, in clouds, in planets, according to which they time their work. They know, of course, that it's going to disappear, and they are unhappy about it. They themselves even now have so many more things to do. They have to meet deadlines which come from the central government, and now many farmers have a second job in order to survive. They feel that they are losing something. Again, they wouldn't put it in musical terms, but they feel that they had a form of perception of time and space which they knew was particular to their individual little spot where they work and live and which they had to learn to perceive and which they had to learn to live with and interact with.

So this was an analytical part, as I said, where I try some more unusual forms of trying to write down times, scoring times. One thing which I found just to make a little parenthesis, is that musicians are very good at this scoring. Scoring is just putting something in time and space on a piece of paper, but it's something that teaches a lot. In my teaching activity I thought that one of the main tasks was just to get people to be able to make some kind of graphic or whatever representation of whatever happens. Not because I think that scores are inevitable or indispensible as such — lots of music is done without. Still I found that equal-tempered experimental music has a lot of insights or techniques regarding the plotting on paper of events in space and time particularly. In a way I feel that it's a pity that this knowledge is just confined to music as such.

So I tried, and I still try, to see how it looks when I make a score. What I mentioned before with the phone booth, or the waves: you see that that makes a nice score, actually. I made a children's piece out of it, where I play the rhythms I had written down with some found objects.

This is, as I say, the analytical approach. Then there is the creative-speculative approach, or whatever you want to call it, where there are different forms for organizing and articulating time. And, yes, there are these harmonic models — the overtone model is an important one. I take the harmonic or overtone series as a possible model to structure very long sub-sonic portions of time. What's interesting is that you don't get the equally spaced intervals as you do with the traditional models. You get different pitches which could potentially tell you about how much time has passed so that you could tune in to a certain overtone (that is part of) what we could call a hierarchy. There is a quality in these time segments which are outlined by the overtone series which is missing in the purely quantitative summation and abstraction-oriented time organization of Western civilization.

PARALLEL DURATIONS

Find out about the beginning and ending times of events that are relevant to the community you live (work) in but that are not necessarily taken notice of by the public (e.g. meeting of the City Council, union meeting, etc.). In a space open to the public (e.g. gallery) install acoustic and/or visual devices which, as the appropriate times, will signal the beginning, the going on, the ending of the events in question and inform the public about the nature of the events.

During the afternoon of
Wednesday, November 30, 1977

at Galleria il Sole in Bolzano

a lamp and verbal announcements
have signalled

the beginning, the going on, the ending of
a meeting of

F.U.L.C. (United Chemical Workers Union)
in the same town

MW: I am curious about how you came to want to use the harmonic series as the basis for this creative-speculative work.

AM: There has been, in a more formalized way since Stockhausen's article *How Time Passes*, this attempt by composers to find a common denominator for rhythms and pitch. People have done pieces with the Fibonacci Series, the Golden Mean, et cetera.

Now, we know that the harmonic series is important as a perceptual aspect in sound, much more so than in other senses. In vision it isn't as much because the spectral visual light is too small, and there are no other areas that I could think of in which overtones, or harmonic ratios, are as important as in music. Since it seems that music has to do a lot with the frequencies or the periods underneath the biological and social cycles which are a few powers of ten downwards from the lower limit of musical sound, or since there seems, on the basis of what I said about the Medieval theorists and what I experienced in my own work, some common traits, I was intrigued by the possibility of taking this one very important organizational principle, that of the overtone ratios, taking it some powers of ten down, and seeing what would come out; whether we would perceive something in sub-sonic cycles which could somehow resemble our perception of an audio spectrum. It is, of course, like all speculative work I try to mirror low, sub-sonic frequencies or have them be a mirror of audio frequencies. It is an hypothesis which might work or which might not work.

Another numerical reference point that I became interested in is the square root of two, which is one point four one four etcetera decimals afterward. I became interested in it because I read a paper by a geophysicist, an Italian, Giorgio Mussetti , who already many years ago had found evidence that this ratio is very important in a whole lot of natural and social cycles; the growth rate of trees, barometric fluctuations, changes in the number of railway passengers, typhus mortality, and so on. He has accumulated an enormous amount of evidence for that. For musicians this is very intriguing because of course the square root of two is half an octave — if you do it twice, you get an octave. So this very common and very important numerical ratio, the octave, together with its means, just seems to be present also down there in the biological, natural and social cycles. You can use this as an organizational element and I think it's worth being looked into as a point of reference.

When we talk about things like the (number art in) musics and when we talk about trying to organize life cycles et cetera, it's very easily accused of being esoteric, of adhering to some obscure and anti-scientific beliefs and so on. If a certain aura of esotericism still remains attached to these fields, I think it has to do with the fact there there hasn't been much aesthetic work done in them — aesthetic in the sense of relating to perception. There is a very low interest in what potentials there would be in trying to shape life rhythms. We have come to be able to accept an enormous amount of alienating procedures and measures in our daily, weekly, monthly, yearly schedules and seem to be much less prepared to do something about that.

MW: We're still very much aligned with the square wave patterns, as you put it.

AM: Yeah. Very simple, very primitive square wave models which are shuffled around in a very unimaginative way, after all. And although we often say; we don't have enough time; there is something wrong with the way we have to rush; we don't have time for families, friends, social activity, paper work, or so; somehow we don't go to the bottom of the matter to see how workable our concept of time is. I just think that it isn't workable and take it from there.

I've been trying to find musical parallels, or sound parallels to this. I've very much looked into flexible working hour schemes, for instance, which are of course an improvement to strict schedules. Yet we see that people don't really know what to do with them to a large extent, that average workers are still a bit suspicious of them. It might not really accommodate individual rhythms. It's still just a wave form modulation; or a pulse-width modulation, as we clal it in electronic music; rather than we **creating** a wave. It is not really an innovative enough model for things.

So what I do, among other things, is I try to see how I quote, compose, unquote my life, my distribution of the work or not work, my time with other people, and so on. I consider this musical work. See, I think that there is a field of activity which has not been paid much attention to, and to which musicians could contribute. I obviously can make a comparison with architecture. Architects have to become involved, really, in a variety of disciplines: they know about urban planning, demographic developments; they know about changes in people's habits; et cetera. They take all that into account and they combine it with some aesthetic approach to organizing space. What I would like to do is become the time architect, or the composer for people's schedules, or be the one who brings the aesthetic side into the various discussions on timing, schedules and so on.

I think music is the only field which could contribute a qualitative side to that. For people in organizations concerned with health, labor, et cetera, time is just a quantity that is added and subtracted and multiplied and divided: calculated. Musicians, on all levels, know that that's not really true. We know that time is not linear. Time cannot be just accounted for in the divisional sense. In the spatialized sense, is how we have come to deal with time. This knowledge, as I said before, unfortunately stays very much within music; in musical practice and concept. It might seem a bit far out to think, Gee, now musicians could take on different tasks, or consider their involvement in other issues. But I think

Earth's north and south poles are now equidistant from the sun, which at noon is overhead at the equator. Equinox means **equal night**. At all places except the poles, the sun rises due east and sets due west, and the hours of light and darkness are the same. (Beginning of Autumn for S.H.) Auroras are frequent around both equinoxes.

there is not such a big gap as one would think. I think it doesn't take much effort: If you write a score, any score, what you do is you schedule events in time and space. (Music is the only art form) that does it to such an extent, and so I think it's the discipline which could give us some terms of reference: Musicians could become not just composers of sound, but composers of life rhythms.

MW: There was a point you made in an earlier interview (MUSICWORKS No. 7, Spring 1979) that a problem with getting to this stage is that music, or organized sound, tends to happen only in enclosed and separated kinds of places and situations.

AM: Yes. Musicians have been giving in to the cultural industry, and of course the cultural industry likes to keep things nicely and neatly packaged. I think musicians don't, of course, do much about the environment. They don't do much about the rhythmic environment, and they don't do much about music either, actually. They do comply, and I think it's almost criminal to the extent they do comply with what the different procedures cultural industries come up with in handling music. I don't think that the scheduling practice for a concert, which is very rigid and has nothing to do with people's life rhythms and life styles, is really the only possible one. I don't think that the use of music as it exists in mainstream music, mainly through the media, is very musical. And I feel the more musicians refuse to take charge of that, the more music will be confined in a ghetto and will be confined in this ivory tower of very revered activity which is not taken too seriously.

MW: What do you mean when you say that you find the music within the mainstream cultural confines not very musical?

AM: I don't think we make a musical **use of music. If you take an average day in a modern western city, of course you find piped in music all over. You find Muzak, which is actually used with very un**musical purposes: it synchronizes people with this piped-in sound to make them work more efficiently. I don't think music was designed, really, to make people work more efficiently for some company!
Especially in this continent (North America) there are tens, hundreds of thousands of people who do have their rhythms, whether they want it or not, somehow conditioned by Muzak's very elaborate distribution in time of certain musical materials. I don't even think, if we speak about 'serious' music, that it's so beneficial to pipe **it** through, to have **it** scheduled according to the arbitrary tastes of some guy sitting in a programming department.

I don't know whether people wouldn't need to be made aware of the fact that listening to music is almost an art by itself. With recorded music, you can just buy the product and do with it what you want. You might just not use it the proper way; it might not be able to fit in to your cycle. We do destroy the original context for non-Western musics — that's another topic. We know that it's been deplored many times, that straight-jacketing a group of performers from somewhere in, say, the Third World into the Western concert practice, concert situation, both spatially and temporally. It has preserved things, but it has destroyed many other things.

So I think that there is a parallel between, on one hand, this indiscriminate **use** of music and on the other hand the apathy toward the acoustic and rhythmic aspects of the environment. We do use music actually **not** to listen now. People with walkmans and earphones are very palpable examples of that. They use the music to be cut off from what's around them. Also from people. This is a very good example of anonmusical use of music.

MW: And what your work is attempting to get at is the opposite: it is attempting to synchronize people with the environment, what is around them . . .

AM: . . . . with themselves. I think that that is what music is all about to a large extent.

When I was living in a smaller town in a more say, homogeneous environement, socially speaking, of course it was a lot easier to make musical experience fit in with what you were doing. You had a more easy-to-handle schedule, a more-easy-to handle load of activities. So music had its place: it could be organized and brought in more organically. We see also that in other cultures music is not this kind of separate activity as we have come to consider it. Musical activity just grows out, very often almost spontaneously, from work activities, social gatherings, and just from the life activities of the people. They might start beating or smashing corn: one woman is doing it, another joins in, and you have a very nice rhythmic counterpoint. It would be hard to ask these women, Are you making music, or are you smashing corn? I guess they wouldn't perceive it as something distinct, or in opposition to something else.

MW: So this is a musical use of music; where it's synchronizing them with each other, with the corn, with an organic kind of rhythm or working together. It's not the imposition of some sort of structure on the activity, but a spontaneous synchronicity with what they're doing.

AM: Which comes out of their way of living!

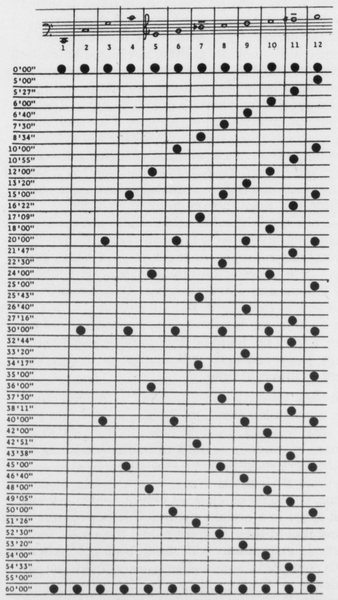
What we might consider is, what do the people who happen to sit next to each other in a concert have in common as far as the overall quote, music, unquote of the day, or days, is concerned? Sometimes very little, and just by some consensus, they are expected now, of course, as the conductor raises his baton, to let everything else be gone, they are just being swept away! The cultural industry has taken over the concert! It's a form that people know, you can market it, people will go to it, even though it is now something very different from what it was when it originated. There **are** successful events where the whole audience has this feeling of being together and hearing the same sub-sonic waveform. Maybe rock concerts provide it more than classical concerts: there seems to be a more identifiable common motivation to go there. Sports events do it: at least half of the audience will rejoice with you or they'll mourn with you if the other side wins. We need that, because we live our daily lives in places where we usually spend out time with people who have other waveforms. In the supermarket or the station, one person is arriving, another going; one is in a rush, another is tired. They all have different cycles. There is what I would call a sub-sonic noise there, because everybody is pursuing different things, has other relationships to time and so on. So people like to go to sports events, like to go to rock concerts, and to a certain extent also to classical concerts.

Many years after having discovered the strength and also the beauty of common sub-sonic wave forms, I went to a prayer in a church because one of my distant relatives died, and I happened to be there in the little village. So there we were in this dark little Catholic church praying for that man. It was a very powerful experience to me to see that we had been engaged in some sound activity because of some common motivation and we did it fairly seriously. We had chosen to be there. I felt there was this common wave that came acoustically because we were praying aloud, but there was something else behind it which I found was very, quote, musical, unquote: Beyond the sonic aspect of it, there was this sensation of a sub-sonic consonance of having been able to tune in to the common activity of invested energy for the sake of this dead man.

In the *Hora Harmonica* piece and the *Dies Harmonica* piece, which I did in Boston, the sound is used primarily to structure time: These pieces are sort of clocks which the sound adds to and gives a dimension to. The main idea is to try to get to the idea of articulating time in a different way and having the sounds being the aural/acoustic hands on this imaginary clock.

In the visual arts we've had artists who exhibit some object that they had found — an object which in one way or another would fit in with their ideas of an aesthetically successful object. So they would exhibit just a stone, a piece of wood, a piece of cloth or whatever. I've become intrigued by this possibility of trying to find rhythms. As I said I very often find things that have a rhythmic structure, and try to write it down and see what comes out and sometimes to do something with it and play either myself or to compare it with other things.

Once I was asked to do some months of experimental music education in a school with children between the ages of 11 and 14. We did some exercises on body rhythms, trying to tune in with somebody else's rhythms, trying to see how we relate to space with our own rhythm of walking and so on. Children are very ready to participate in things like that, and it was of course also playful so they had a good time. But I think music education, even in its more enlightened forms, still maybe does not focus enough on the aspect of children really trying to find



HORA HARMOICA is based on a twofold transformation: as sound becomes rhythm, time becomes music.

The piece is based on the subdivision of the chosen time-span in harmonic partials up to the 12th overtone. (Imagine a sound being slowed down by 5 or 6 powers of 10.) This yields the following periods:

1. 60'
2. 30'
3. 20'
4. 15'
5. 12'
6. 10'
7. 8'34"
8. 7'30"
9. 6'40"
10. 6'
11. 5'27"
12. 5'

In turn, this rhythmic structure is made audible through sound: a pitch corresponding to a partial of an audio spectrum is assigned to each subaudio period: the fundamental to the 60' period, the 2nd overtone to the 30' period, etc.

These pitches occur at the beginnings of the period of their sub-audio counterparts and at the end.

HORA HARMONICA may be presented as

-a performance piece: any sound source or combination of sound sources tunable to the exact intervals of the overtone series may be used, sound sources with very complex waveforms should be avoided, however. (In the score the approximate pitches of the overtone series of C are given as an example, but any other overtone series can be used.)

-as a sound installation from tape (once only or continuous); it should extend through several spaces through which the audience may move freely.

HORA HARMONICA was presented as a sound installation at Ontario College of Art, November 15, 1984 from noon to 1 p.m. The overtone seris of a 60 cycle per second tone was used. A portion of an ambient recording of the installation can be heard on MUSICWORKS 29 cassette.