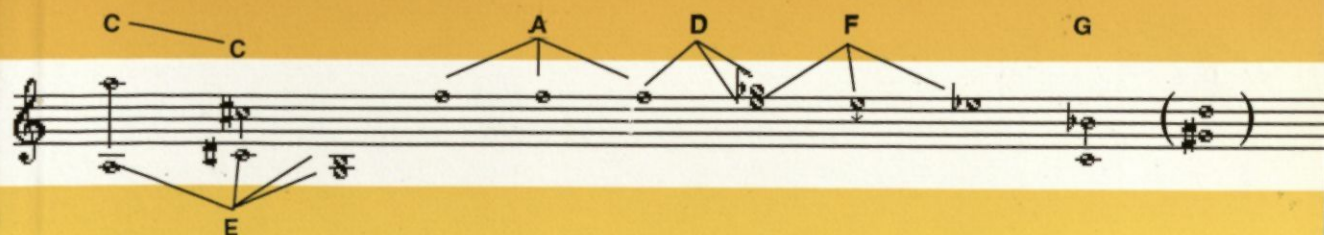
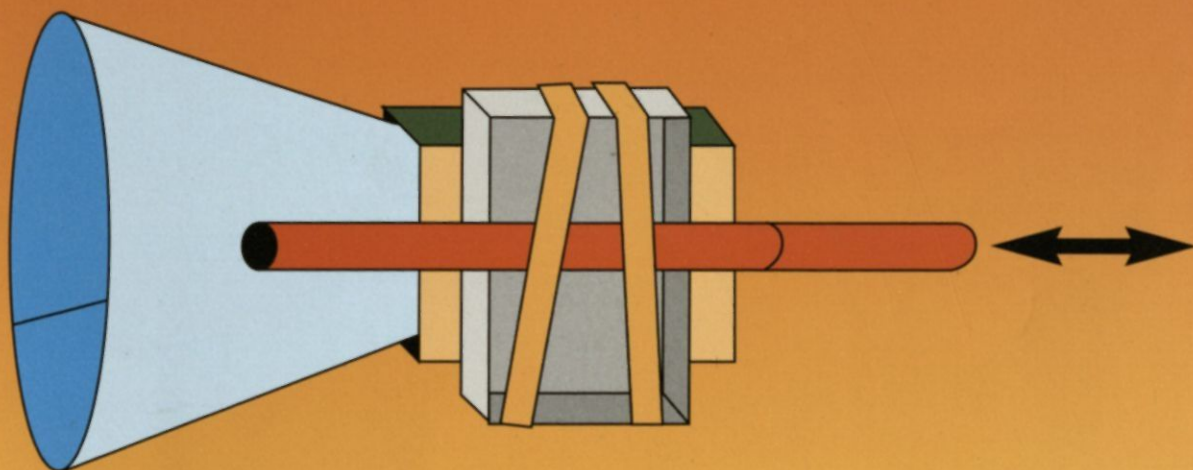


Hugh Davies

SOUNDS HEARD

A Potpourri of Environmental Projects and Documentation,
Projects with Children, Simple Musical Instruments,
Sound Installations, Verbal Scores, and Historical
Perspectives.



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Perspectives.

Hugh Davies



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For Pam and Rebecca, with love;
thanks for being my guinea pigs

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Introduction

Over the years I have jotted down on paper the descriptions of unusual environmental sound experiences. The first of these were a set of seven short texts that I wrote during a few days spent in the mountain village of La Sainte-Baume, inland from Marseilles, in the summer of 1974; part of their collective title, **Sounds Heard at La Sainte-Baume**, has remained with me as a very suitable description of such work. Subsequently I wrote down several descriptions of similar experiences from earlier, and continued to add new ones, including the related **Environmental Music Projects**. Soon I found it appropriate to organise them into different categories, and I typed them up on several sheets of paper. Photocopies of these I gave away to friends and colleagues or sold them at cost price, but I was unsuccessful with several earlier attempts to publish what would have been a much more modest book based on these texts, the first in 1978. A few years ago I retyped all the **Sounds Heard** texts and **Environmental Music Projects** into a computer, and copies of this updated version have been on sale through mail-order distributors in Italy and the USA.

Most of the texts from the complete set of **Sounds Heard** have been published previously, individually or in groups, in magazines, catalogues and books in several countries. On two occasions they were accompanied by photographs or drawings that had been selected editorially rather than by me. For the present publication I am delighted to be able include, for the section **Seven Portable Found Instruments**, two watercolours painted specially by my daughter Rebecca, supplemented by Trevor Taylor's photographs.

The book was initially centred around my collection of environmental listening texts, but it also contains many other short texts on related themes: apart from articles on aspects of music and the arts in general, there are also performance scores, instructions for building simple instruments, descriptions of sound installations and sound environments, projects with children and two poems. Some of these are occasional pieces, others are central to my thinking about my work and that of friends and colleagues. What they all have in common is that professional performers or specialist instrumental resources are not essential, and improvisation almost always plays a substantial role. The best parallel that comes to mind is that virtually everybody tells jokes, often made-up ones, yet very few of us become stand-up comedians; those who decide to become professionals are not necessarily any more inspired than the best amateurs. Another comparison is with those film actors who are to play a musician or sports personality, and in the course of a few weeks manage to learn sufficient professional skill with a coach to be able to perform a selection of relevant actions convincingly.

In addition to those projects that specifically involved working with children, some of the other texts and scores in this book clearly have the potential for educational application, perhaps particularly at a junior level (quite early on I realised that the age group with which I identify best is from eight to thirteen). On the few occasions that I have been able to work with children on longer projects, I have tried to give all of them the opportunity to make music on an equal basis, regardless of whether or not they have had some form of musical training. In addition to an ensemble piece created with and played by a group of children (**Jigamaree**), many of the tracks on the enclosed CD show the musical potentials of unconventional easy-to-play instruments and sound sources. Naturally my approach only takes people a certain distance - hopefully sufficient to interest some of them in exploring music more seriously - and ultimately it is no substitute for a proper musical training, even if this only consists of learning to play an instrument.

Although I decided on the title **Sounds Heard** almost by chance, as an invitation for people to listen to environmental sounds in the way one listens to music, I later discovered that it has another

interesting connection. In 1990 James Tenney informed me that Cage had recently come up with a new definition of music as "sounds heard", as a refinement of his earlier "sounds one hears are music" (from the "Afterword" to **A Year from Monday**, 1967).

During the preparation of this book I toyed briefly with a different title, in an attempt to describe its contents more accurately. This was "Innocent Music". Those who are involved in British improvised music may immediately think of Eddie Prévost's recent book **No Sound is Innocent** (all sounds conjure up associations), but my actual reference is to Cornelius Cardew's use of the term "musical innocents" to describe performers who lack a formal musical training, from his article **Towards an Ethic of Improvisation**.

Some of the descriptions of simple instruments and scores in this book are intended for practical use, but - just as in a recipe book - there should be sufficient interest in their basic ideas to make it at least worthwhile to read through them and imagine their realisation, in the same way as with the **Sounds Heard** texts. Indeed technical progress has meant that the essential materials for some of my scores have long been unavailable ("record your own voice" booths in **Voice**) or are rapidly becoming so (musical boxes for **Interlude**). I would be grateful if anyone who performs any of these scores would send me the details; my e-mail address is given at the end of this Introduction.

People who only know other aspects of my work (as composer, performer, instrument inventor and researcher) may be surprised that in these pages electronic music and equipment is rarely mentioned, principally in texts that date from the early period when I felt that this was the field I was working in, whereas texts written a few years later show that with hindsight the start of my career could be considered very differently. What is entirely typical for me is that the book is full of very varied material, in this case my personal ideas and insights from a period of almost 40 years. Hopefully, like most anthologies, there will be something of interest for everyone.

I have organised the contents of this book into several themes, adding comments in italics after many of the items. In revisiting these texts, in some cases after some three decades, I have avoided wholesale rewriting, but it felt necessary during the retyping process to make very small alterations in many of them. Some of them clearly "show their age" but continue to be relevant, so my improvements are mainly in their sentence construction, clarifying clumsier passages and updating a few terms and concepts from the viewpoint of today. More substantial revisions are indicated in some of the comments.

In several of the comments I have indicated other people's prior or contemporaneous work with similar materials. Whoever comes up with an idea first deserves credit for it, but this is less significant than the person who, perhaps without knowledge of any prior work, fashions a particular medium or approach into something of real value. Some of my early ideas in this book are clearly one-off explorations of possibilities that I chose not to pursue further.

The majority of the earlier texts printed here date from between 1964 and 1981, overlapping with the beginning of my greater concentration on research over the last 25 years; in addition, several recent unpublished texts are, inevitably, based on much earlier ideas and observations. Unlike anthologies such as those of John Cage and Pauline Oliveros' **Software for People** (1984), which include the composers' complete writings from a certain period in their lives, I did not feel that the contents of the present book would mix well with my specialist research writings, which would take up a substantial volume on their own; although these are closely linked with my creative interests, they are less directly influenced by them. My initial plan was to play down the connections with my work as a composer, instrument inventor and performer, but during the final preparations I have found as myself increasingly emphasizing them; I welcome the opportunity to have been able to mention in my texts and comments the names of many friends and colleagues with whom I have worked over

the years.

My Do-It-Yourself approach in this book is, of course, nothing new, and is shared in some respects with many of those whom I regard as my friends and colleagues. Its ancestry includes the non-syntactic sound poems by the Futurists and Dadaists around the time of the First World War, Cage's stories (first collected together in the 1958 lecture **Indeterminacy**, and published in **Silence**, 1961, and extended in his subsequent books) and verbal scores, the verbal performance scores of the Fluxus group in the early 1960s, the verbal scores of composers such as Karlheinz Stockhausen, Christian Wolff and members of the Scratch Orchestra from the end of that decade and the environmental sound descriptions and listening pieces documented from around that time by composers such as Oliveros, R. Murray Schaefer and Trevor Wishart. However, my own first verbal score (**Moonlight**, included in this book) was written in 1964, predating some of the above, and before I knew about most of the others, and I wrote several other verbal scores from 1968 onwards.

The accompanying CD is designed to illustrate many of the aspects covered in the book. None of the music was played on conventional instruments. Many of my simpler instruments, especially "found objects", are represented by short tracks sandwiched between longer ones. Apart from a performance by a group of German schoolchildren (the only track on the CD that was previously available), most of the tracks are, of necessity, "professionally" performed - mainly solos played by me on my invented instruments and sound sculptures; but there is also a duo played with another composer on one of my sound installations, a trio for modified musical boxes (in which my wife and daughter joined me as performers) and a quintet played on egg-slicers in collaboration with other improvisers - which could only be recorded in three successive layers in different countries. The CD also includes, as parallels to the other projects, a very early tape collage produced with the most basic equipment, that would nowadays be described as "plunderphonic", and a tiny composition for a toy musical box (**Composition with Cadence**). The cardboard disc with holes cut into it for the latter is one of only two precisely notated "scores" involved in these recordings, the other being a computer text file (**Printmusic**).

Acknowledgements

I would like to thank my wife Pam and our daughter Rebecca for their love, support and tolerance of the disruption caused by my preparing this book for publication; Clive Graham (Paradigm Discs) for the digital editing and mastering of this CD, and many of the recordings, as well as for his assistance on several other projects over the last few years; Trevor Taylor for his practical support for my work, including the publication of this book and most of the photographs in it, and Ewan Rigg for converting my computer files and graphics into the finished product.

Thanks to the following for their participation on the CD:

- Rebecca Davies in her solo **Embellishments**
- Pam Davies and Rebecca Davies in the trios **Interlude**, **Lid Clickers** and **Nut Whistles**
- Julia Usher for joining me in the duo **Collective Responses**
- Johannes Bergmark, Adam Bohman, Martin Klapper and Mats Lindström for their egg-slicer performances in **Eine kleine Eierschneidermusik**
- the children on my course in Bonn 25 years ago who performed **Jigamaree**

Before making their recordings Pam Davies, Rebecca Davies and Julia Usher had only a few minutes to familiarize themselves with the respective instruments, rather as does an exhibition visitor, and only one "take" was possible. This was not planned by me but forced on us by external circumstances - another type of "innocent music", in which a trained musician is confronted with an unfamiliar instrument. I am reminded of a tactic that we used in Gentle Fire, a (primarily) live electronic group of which I was a member from 1968 to 1975: if during a rehearsal we became musically self-indulgent in a freer musical situation (with unspecified instrumentation), we would

swap instruments, forcing us to play only what we felt to be musically essential. The two very different versions of **Embellishments** on the CD show something of the musical potential of this particular sound installation; while my daughter was familiarizing herself with it, she even managed to incorporate some of the melody of "Maria" from Leonard Bernstein's **West Side Story**.

Hugh Davies

hugh-davies@beeb.net

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DANGER!
MODERN MUSIC INSIDE

Music and the Arts Today

My Artistic Make-Up (1989)

Rather than learning from teachers, I have always preferred to find things out for myself. I studied music conventionally at university, at a time when music was considered to have ended around 1920 (in some instances somewhat later, perhaps around 1950), but my view of music is very unacademic (including a love for non-Western music and instruments). I am self-taught as a composer but today I am far outside my origins in the mainstream avantgarde.

An inherited do-it-yourself approach and tendency to get my hands "dirty" led me unwittingly in 1967 to divert half of my compositional creativity into inventing and building new amplified musical instruments for me to perform on, both in specially-devised compositions and in collective improvisations. Previously I had little idea that I might become a performer, and especially not that I would often appear as a soloist.

Given a deep-rooted curiosity about why I am able today to work as I do, I have researched in detail (starting at a time when little overall documentation existed, especially in English) all the new methods of creating music that were introduced in the 20th century: taped and live electronic music, and newly-invented or modified acoustic, amplified and electronic musical instruments - all of which I have employed compositionally. My publications have been printed in 11 languages in 17 countries, and include contributions to nine dictionaries; some of them, such as my articles in four of the New Grove dictionaries over the last 20 years, have obliged academics to take seriously research areas that previously they had largely managed to ignore. So far this seems to have scarcely happened in Britain, but in some other countries there are encouraging signs.

These different aspects of my work often cross-fertilise each other.

Soon after I had built my first new concert instruments (1967-68), I met the visual artist John Furnival, with whom I collaborated on and off over a period of several years on a number of instruments and, especially, tactile sound sculptures that are intended for the public to play in exhibitions (normally in museums and galleries, but we always liked the idea of venues where people have to wait around with nothing to do, such as in hospitals, doctors' and dentists' waiting rooms, bus and railway stations, airports, etc.). This collaboration increased my confidence in the visual aspects of my work, which was very important for someone who "cannot draw" - though computer graphics has partly helped me to bypass this. It also finally eliminated any danger that my more "experimental" concert music might have caused me to retreat into the proverbial ivory tower, and (among other things) has led me to giving occasional workshops in instrument building, composition and performance for children (some with special needs) and amateurs.

*Revision of a text written for the catalogue of the touring exhibition **Making Music: New and Unusual Instruments** (Midland Arts Centre, Birmingham, 1989). Rather than contributing a more predictable artistic statement, for some reason I found myself writing a more basic credo.*

The Role of the Artist (1976)

In my work as an inventor of new musical instruments there are many indications that "anyone can be an artist". Very little that I do can be fitted neatly into existing categories and pigeon-holes; in many ways I have become far removed from my original academic training as a musician. Many "non-artists" do not have sufficient confidence in their artistic abilities for them to nurture ideas that are similar to those that form the basis of the work of an "artist", so that they do not develop them to a logical conclusion and find an appropriate form for their presentation. Instead the ideas are either completely rejected or at least treated as (often humorous) trifles.

At the very least, an artist can help to make people's immediate environment and individual situations more attractive, by speaking out (either literally or metaphorically) in a way that the average citizen does not bother to do or have time for - both against injustice, vandalism (in the wider sense) and oppression of any kind, and by questioning things that are normally taken for granted in our societies. The artist can also help to draw people's attention to things of interest, beauty and humour that might otherwise largely go unnoticed, and can prepare us by conveying some idea of what the future may hold in store, in work, leisure and human relationships.

I have always found it more stimulating to let my own development be shaped by whatever comes my way in terms of work opportunities, rather than by planning and seeking out only those things which I feel are appropriate or might be useful. The random combination of several chance elements frequently forms my different activities into extremely logical and time-saving groupings that would be hard to surpass otherwise, even with meticulous planning, so that I am able to concentrate primarily on one particular area for a longer period of time, without unduly neglecting other areas. I am always interested in placing myself in new contexts, and in collaborating with people in other disciplines (not only artistic).

*A revision of three sections of my response to a questionnaire in the symposium "Art and Social Purpose", published in **Studio International** (March-April 1976).*

Point of View (Manifesto) (1977)

Art forms that are truly relevant and contemporary always reflect the society that engenders them. In today's Western society there are growing tendencies of such elements as worker participation, community involvement, despecialisation, decentralisation and environmental awareness - as a reaction against depersonalisation and Molochian control by faceless governmental bureaucracies and industrial giants.

In music, these tendencies occur in collective composition, indeterminacy, improvisation, music theatre, sound environments, sound meditation, and so on. All of these reduce the overall dictatorial control traditionally assumed by the serious composer, in favour of increasing involvement of performers, amateurs and children, along with a demystification of the whole craft. It is often the composers of today who have themselves introduced such changes; many of them have also found it necessary to go further, in some cases setting up their own forms of distribution of the music and ideas, publishing their own scores, magazines, records and tapes.

It is for artists in all areas to sense the undercurrents that will develop into prominent aspects of their society's future, presenting them (and their implications) in their creative work.

A Parable: Gondwanaland (1984)

During the 1970s Gondwanaland, a small third-world country in the Middle East, discovered that it possessed substantial deposits of oil. This previously very poor country, that had been ruled autocratically by one family for many generations, rapidly entered the 20th century. Many schools were built, a free health service was set up with up-to-date hospitals, and many other Western features were introduced. Steps were taken to devise a more democratic form of government, with elections, and a more equal role for women was initiated.

Up to then, all the arts in Gondwanaland had been folk arts, unsubsidised, and largely practised by people in their spare time. Because very few people (mostly members of the ruling family) had been educated in or had even visited the West, there were no art galleries, theatres or concert halls. With the sudden influx of money and Western ideas into Gondwanaland, a group of artists (painters, sculptors, poets, story tellers, musicians) felt that some money should be made available to support the arts, as in the West.

A representative committee of them arranged a meeting with government officials. At the meeting the officials pointed out that nearly all the subsidies for the arts in Western countries were for administrators, museums, galleries, theatres, theatrical companies, concert halls and orchestras, little of which was relevant to the situation in Gondwanaland. The government was prepared to build several museums, galleries, theatres and concert halls, primarily to house national culture in its existing forms; but it did not want to affect too much the way in which the arts functioned in their society, and did not wish their national characteristics to be too influenced by Western ideas.

However, the Gondwanaland government was very interested in another possibility, for which money would also be available. It wanted to develop a form of government, from scratch, that would be appropriate for the country and the needs of its people. There had been a proposal that artists, who were in close touch with the grass roots and drew their inspiration largely from everyday events and ordinary people, might have a valuable contribution to make to the country's development, providing fresh ideas and longer-term insights. The government was prepared to set up an artist-run think tank, where social and cultural research could be undertaken, and practical projects coordinated. This was felt to be more valuable than paying artists to do the sort of work that they were anyway already doing anyway.

The artists in Gondwanaland found this an exciting prospect, as an appropriate new channel for their creativity. Instead of working in unrelated, often boring jobs, they would receive salaries commensurate with their abilities, and would feel that they would be contributing more to their country than had previously been possible, especially those who were living in towns and had lost the direct function of the arts in simpler, more rural societies.

Several of my texts concerning the role of the artist in today's society were written during the period in which I was a member of the Artist Placement Group, from the mid-1970s to the late 1980s. My parable summarises some of APG's aims in neutral terms.

**An Excursus into Uncharted Domains of Comparative Musicology
OR
How to avoid making the same old mistakes all over again**

seventeenth	During the	twentieth
	century, Western music	
	saw the development of a new	
<u>solo and ensemble</u> instrumental	genre:	electroacoustic, or electronic
Unlike other musical cultures, notably those of the Far East, instruments	music.	Electronic equipment
	had been previously used largely in a subsidiary role;	recording and transmitting music (as well as speech, etc.) for gramophone and radio, and studying
(apart from music for the organ and other keyboard instruments): filling in missing parts	acoustics	(resulting for example in methods of adjusting the acoustical properties of a concert hall).
in vocal ensembles, substituting for a choir in churches, and on festive occasions.	With the growth of	"non-tonality" (it is too soon to find a <u>positive</u> term to include the whole field)
tonal, functional harmony	came the first	"creative" use of electronic means
independent (solo and ensemble) instrumental music	and, with it, new instruments; some, like	the synthesizer,
the clarinet,	pecially developed for the first time, others, like	the tape recorder,
the violin,	the result of integrating elements from several existing instruments, which in turn had had a long period of development. It is almost as if these two "innovations",	"non-tonality"
tonality	and	electronic
instrumental	music, were each designed to fulfil the great range of possibilities opened up by the other.	
	Until this period the majority of performers had required no	
mechanical	devices	electrical
	with which to produce music, but had used	instruments which had become virtually as common as human voices.
the most common of all musical instruments, the human voice.		

Then came a widespread but gradual introduction of the new electronic equipment

instruments largely due to the efforts of small groups of enthusiasts, who were initially hindered by the (comparatively) small number of instruments already in existence, their high costs of production, and prejudices against the use of electronic equipment,

instruments, which were associated with "inferior" social status and "extra-musical" functions.

But, as with all successful innovations, electronic

instrumental music grew in popularity and soon became of supreme importance.

Whereas the leading composers of the period between 1500 and 1850

1500 and 1950

1600 were, to a large extent, the leading figures in all aspects of concert-giving,

singers of the day, their successors, in a very brief space of time, were the leading exponents of electronic music.

instrumentalists (violinists, and later pianists).

At first the new electronic

instrumental music, still regarded with suspicion in many quarters (particularly by performers

singers and people connected with the "traditional" music of the time), kept rather to itself, but gradually it came to be combined and integrated with "instrumental-and-vocal"

vocal music, and accepted on equal terms with it. (About four centuries previously a similar situation had taken place,

when Western music developed harmony and polyphony for the first time: composers became professional musicians, whereas all previous music had been composed - almost invariably anonymously - by monks.)

Musical Environments (1990/2002)

This is a survey of some of the ways in which I have presented my music, especially the relationship of the performer (or composer-performer) with the audience, and my thoughts about musical environments.

The first aspect is based on observations made as both performer and listener over many years. At conventional concerts of classical music the audience arrives, usually after a hard day at work, and expects that the music will be performed to them with no need for any active participation on their part. This is in marked contrast to the situation with more popular forms of music: in a jazz concert the audience applauds after a musician's solo, instantly responding to its quality, even while the other musicians are still playing; in a rock concert the audience will clap rhythmically and sometimes sing along in certain familiar songs, encouraged by the performers; and in folk music they will not only sing along but are sometimes invited to learn a new song. Normally the classical audience has tickets with seat numbers printed on them, so that each person meekly sits in his or her allocated place and does not need to make any decisions. This situation changes when the seats are unnumbered; each member of the audience, or at least the earlier arrivals, is free to choose a seat, and seeks out a special place, one where they feel comfortable (a similar description is given in one of Carlos Castaneda's early books, applied to an empty room); from my own experience I know how this is affected by such physical features as the shape and size of the room, and where the entrance door is located.

In certain circumstances (especially when there are many empty seats) one thing that musicians can do, in order to involve the audience to a greater extent, is to invite people to move forward, so that they will "hear the music better". They may not actually hear better in their new seats, but it is psychologically more reassuring to the performers if the front rows of seats are fairly well filled; more significant is the effect this has on the audience, who have either accepted their allocated positions or have chosen a personal one for themselves, and now have to make a new choice from more limited options. Inevitably, in their new seats, they will now be in a somewhat different frame of mind, hopefully more receptive to an unusual musical experience.

My second aspect concerns a small family of my compositions which are wholly or partly based on environmental sounds, somewhat parallel with a group of my works in which selected fragments by an earlier composer (Purcell, Handel, Scarlatti, Satie) are reduced to sequences based on their harmonic tension. Two of these works, **Meldoci Gestures** (1978) and **Meldoci Gestures from the British Isles** (1979), are based entirely on the songs of selected birds and animals and subjected to a particular treatment, transposing them (on tape) from their normal pitch ranges and speeds to those of human music. Some of them, primarily bird songs, that we appreciate most in real life did not transpose effectively, the most successful tended to be those songs that are normally too fast or - like that of the blue whale - too slow for us to follow what is happening melodically. Naturally the result is rather different from the original songs, but something of the original character remains.

What is perhaps most noticeable with music derived from wildlife songs is that although it moves forward, just as in human music, it is somewhat more static; what is lacking is the human drive and thrust, the sense of going somewhere. I have likened this to a city map, on which someone has drawn a roughly circular route. The "human" version of this route is determined by conscious decisions, such as a local person who is going shopping, and has planned their route so that the heaviest items will be bought last. The "wildlife" route is more that of a tourist, who decides to walk along a particular street in order to look at a building more closely, or to walk a bit further than planned in order to rest on a convenient bench or make a telephone call from a call box.

My third environmental aspect concerns three "what-if" works of mine, the sound installation **1930s Electronic Music Studio** (1984) and two music theatre works, **The Birth of Live Electronic Music** (1971) and **The Search for the Music of the Spheres** (1978). Here an imaginary but unlikely environment is recreated in a musical context.

In the sound installation **1930s Electronic Music Studio** several unusual instruments and pieces of older equipment are set up on a table, like a laboratory workbench. It could have happened that somebody in the 1930s would have hit on the idea of setting up an electronic music studio, in the later sense that we know now. All the technology for this already existed (in some cases as early as the 1870s). This sound installation recreates, partly tongue-in-cheek, the

sort of instruments and devices that might have been found in a mid-1930s electronic music studio - 15 years before the first such studio actually existed - using the technology (or its more recent equivalents) that was available at the time; this includes that of the telephone, radio and gramophone. Some of the instruments, however, are not quite what they seem to be (a theremin-like instrument, for example, is actually a Saraga-Generator, which uses a photocell rather than hand capacitance to vary the frequency of an oscillator). They all require the visitor's participation in order to produce any sounds.

It is only very recently that our electronic music studios have been able to invest in commercial electronic musical instruments on a large scale: these in turn were developed from the modular synthesizers that were originally designed in the mid-1960s for studio use. During the 1920s and 1930s all "electronic music" was performed live on their more distant ancestors, the earliest electronic organs (some based on the analogue equivalent of sampling), electric pianos and monophonic instruments such as the theremin, ondes Martenot and Trautonium; even the simpler acoustic technique of manipulating prerecorded discs on gramophone turntables, with which several composers experimented in the same period, did not form the basis for any completed composition until 1939 (John Cage's **Imaginary Landscape No. 1**). Only with the commercial advent of the magnetic tape recorder in the late 1940s did people seriously think of exploring in a non-melodic fashion the sounds and noises that would previously have been considered as mere sound effects.

The Birth of Live Electronic Music simulates an acoustic equivalent of an electrical amplification system in performing live an imaginary collage of 1930s 78 rpm records. A phonofiddle (a stripped-down early 20th century violin with horn attached, devised to increase the instrument's volume for recording purposes) is connected to a length of plumbing pipe that stretches across the stage. Next to the player are two "vocalists", who imitate all the extraneous noises associated with old records - hisses, clicks and scratches - using plastic funnels like microphones, which are also linked to parallel lengths of pipe. On the other side of the stage a mixer-operator rotates a large red stopcock tap to vary the loudness of each of these three inputs, with the sound heard over a small circular folded-horn acoustic loudspeaker (the central part of a 1927 electrical unit, the very latest in German hi-fi). Two "gags" are included: at one point the imaginary gramophone winds down, with the phonofiddle player's hand sliding lower and lower down the instrument's neck, slowing the music down and finally stopping altogether (the mixer-operator winds up an old gramophone nearby, and the phonofiddle player quickly comes to life again); and at another point the music gets stuck in a groove/a groove/a groove/a groove ... until the mixer-operator walks over and gently pushes the player's shoulder and the music then continues normally.

In **The Search for the Music of the Spheres** a science-fictional "mad" scientist builds a special receiver to listen to the "music of the spheres". All the sounds are produced by the props used in the performance, and the whole work is presented like a "silent" film, when from time to time the performers freeze, the lights go down and a caption is projected onto a screen, before everything continues normally.

A fourth approach to environmental sound can be found with my invented instruments. Some of the earliest (from 1968) are stereophonic, and - after one slightly later quadraphonic one - in the late 1970s I began to build new quadraphonic instruments and to expand a couple of existing ones. With two or four loudspeakers one can control the structuring of the musical space, even though this is less sophisticated than can be achieved with electronic gadgetry; multiple microphones and pickups enable the sound sources to be moved between the different loudspeakers. Any form of multiple loudspeaker system involves the audience to a greater extent, as they are mostly between or inside the principal sources of sound.

With chamber music performances I have often felt as if there was a glass screen between the performers and the public, and this separation is further emphasized by the fact that classical musicians rarely speak to the audience, unless announcing a change of programme or apologising for some disaster. Indeed talking to the audience, as with asking them to move further forward, can be extremely positive. On another occasion in the same festival in Telluride as the original form of this text was delivered, my performance of a rather quiet and delicate solo piece was immediately preceded by a rousing session with a famous folk singer, Peter Yarrow; I decided to say a few words, and explained that I had nothing special to say, but needed to alter the atmosphere, and calm them down a bit, in preparation for my own performance. In exhibitions I have concentrated on constructing participatory sound sculptures and installations, where no sound is produced without the actions of visitors, more or less like playing a simple musical instrument.

Because my instruments are mostly quite small, and my gestures are normally with fingers rather than with hands and arms, whenever it is practicable, I ask for a further alteration to the concert environment, in the form of a fixed camera trained on my instrument or performance table and linked to one or more television monitors placed in front of the stage and/or to an overhead projection screen.

A fifth area of my ideas on musical environments concerns the documentation of unusual sounds heard in everyday environments, either urban or rural. These form a complete section of this book, under the heading **Sounds Heard and Environmental Music Projects**.

My final thought on musical environments: perhaps we should start planning for the first concert on the moon.

*This text is loosely based on my spoken contribution to a forum on Musical Environments during the Composer-to-Composer festival in Telluride, Colorado, in 1990, and incorporates the programme note/visitors' instructions for my 1984 sound installation **1930s Electronic Music Studio**. See also the text **My Environmental Music** elsewhere in this book.*

Future Developments in Electronic Music (1972)

It would seem to be almost a quirk of chance that the earliest electronic music involved the use of tape or disc storage and manipulation. Extrapolating from the present state of contemporary music, two aspects are clear with regard to future developments: the first step will be one of regarding electronic music as a performance-oriented medium like vocal and instrumental music, with prerecorded tapes used only in special situations where the results required cannot be produced live in performance but must be prepared in advance in a studio. The second will be the relegation of "electronic music" to a convenient subdivision of the whole range of music for peripheral applications like music publishers' catalogues, where it will join "piano music", "chamber music", "orchestral music" and so on. In a similar way to that in the early renaissance when, as far as the mainstream of music was concerned, new elements - the introduction of "mechanical" methods of sound production with the first independent instrumental music - initially remained largely isolated from the existing vocal music, and only later merged with it, becoming simply "music".

Indeed these two developments are already with us, waiting for the majority of musicians and listeners to realise that they exist; however, unless ingrained historical inhibitions to appreciate contemporary trends are overcome, critics and musicologists will not become aware of them for some time, since live electronic music has only recently begun to be accepted and comprehended. The recent growth of small groups of composer-performers specialising in the use of electronic equipment has been primarily responsible for these developments. With such groups a general tendency has been to start out by assembling a substantial quantity of personally-owned equipment, not only for amplification but also for sound modification, and then to realise that the ways in which the performers produce sounds on their instruments become increasingly closer to those previously obtained by using transformation equipment. The result is that it is no longer of interest to anyone apart from the actual practitioners as to whether the sounds are produced by means of electronic transformation, by the amplification of actions which produce little acoustic volume, or (usually in a smaller room) with no use of electronic equipment at all.

This feedback influence of the type of sounds introduced originally by taped electronic music is further substantiated by an increasing interest among the musicians involved in live electronic music in constructing new, usually amplified instruments whose sounds range from ones associated with conventional instruments to those familiar in electronic music. These sounds are, furthermore, "natural" to such instruments, as opposed to some of the techniques required to produce equivalent sounds on conventional instruments, such as singing at the same time as blowing into a wind instrument, producing sounds inside a piano, and a range of "small" sounds which become audible only when they are amplified. Historically it is not surprising that new instruments are invented at such a time when a new era of musical language has come into existence, appropriate to the range of musical expression (tuning, timbre, etc.) of that era. It turns out that synthesizers, which (because they are better known) might be considered to qualify for this role, have so far only begun to progress beyond being collections of devices that were originally developed for a variety of non-musical functions; they still need to evolve towards their potential sophistication in terms of sufficiently-flexible, performance-oriented design and layout, in order for musicians to be able to achieve results with them that are comparable to those already achieved by cheaper and far less elaborate instruments.

We must beware of burdening ourselves with superfluous technology for the mere sake of using what is available, unless our musical impulses clearly call for it.

*Originally written, as one of several brief contributions by composers, at the request of the author of a forthcoming book on electronic music, but mine arrived too late. First published in the first issue of the short-lived magazine **Microphone**, and simultaneously in a Swedish translation. Similar arguments are put forward in a couple of other early texts of mine.*

Four Categories of Live Electronic Music (1972?)

The instantaneous, real-time transformation by means of electronic equipment during a performance of sounds from any one or more of the following types of source:

- conventional musical instruments
- specially-constructed or adapted instruments or found objects, often with special contact microphones (sometimes permanently built-in)
- sounds prerecorded on tape or other sound storage medium (especially sounds that could not be produced live in the concert space), either created in a studio or recorded in an external environment
- electronically-generated sounds

*I have incorporated earlier versions of this list in at least two articles, the first of which was "Electronic Music: History and Development", John Vinton (ed.): **Dictionary of Contemporary Music**, Dutton, New York / **Dictionary of 20th Century Music**, Thames & Hudson, London, 1974. It is a typical example of my attempt to make sense of one of my principal activities by categorising all its possible applications.*

Improvisation, Indeterminacy and Intuitive Music (1970)

There has recently been an epidemic of reviews of contemporary compositions in which the word "improvisation" has been bandied about, almost invariably showing a complete misunderstanding of what it means and of what is actually involved in the different pieces of music that were under review. This is even worse than the reviews of programme notes which many critics resort to when faced with new music. From the opposite side, those musicians who are only involved in improvisation, there are objections that composers are asking players to improvise and then claiming the performing rights for themselves.

Here are a few thoughts about the most common (and commonly misunderstood) terms.

IMPROVISATION

The particular combination of instruments used and the interaction of the individual personalities of the performers (and the predominance of the strongest one) and their respective musical backgrounds will define the musical style, unless the musicians agree in advance on a style in which they will improvise. Thus a "free jazz quartet" defines fairly precisely the sort of improvised music that will result and the sort of instruments that are played - any performer in such a group who either plays an instrument that is not normally used in jazz or has never played jazz but comes from a background of "straight" improvisation will tend to fit in with the other musicians as much as possible.

The performers inevitably tend to draw on the basic melodic, rhythmic and textural formulae and clichés that are available to them from their past experience. Structure almost invariably follows a slowly undulating pattern of rise and fall, occasionally building up to a large climax. Such build-ups tend to take from 30 seconds to a couple of minutes. Improvisations tend to last from between 15 and 45 minutes, though outside traditional concert situations this may be as long as one-and-a-half hours; a few groups regularly play for two or even three hours. Performers play mostly as they would do on their own, but interact considerably with each other (generally with one other performer at any time), imitating, counterpointing, supporting or undermining each other. Improvisation groupings are sometimes ad hoc, and sometimes have a constant line-up; once the members of a regular group get to know each other musically, they can explore less obvious structures and interactions, perhaps even pushing each other (in a musical way) more aggressively.

The latter is illustrated in a text I wrote for Derek Bailey's book **Improvisation: Its Nature and Practice in Music** (1980). In an earlier remark about the Music Improvisation Company, of which he and I, together with Evan Parker, Jamie Muir and (later on) Christine Jeffrey, were members, I had stated that "you could play in the secure knowledge that one or more of the other players, almost always particular players that one was 'aiming at', would react to you in a particular way, without necessarily playing the sort of thing that you might have expected them to play - in other words a security which enabled unrestricted exploration of the new musical possibilities to take place." Derek was surprised about my feelings of security, and asked me to explain. "The most specific memory - indeed virtually the only one - that I have of a particular 'incident' during one of the performances of the Music Improvisation Company, is of a concert that we gave in Durham. At one point Evan Parker began to play extremely high notes on his soprano saxophone, fairly fast figuration within a small pitch-range, very intense and clearly quite an effort to maintain. I knew that he was expecting another musician to join him up there - musically speaking it was almost as if he was asking one of us to do so - and at that moment I was not only perhaps the most obvious choice because of the suitability of my instruments, but also I was not playing at the time and thus was free to join him. However, I waited until he had very nearly given up for lack of response, before suddenly taking up his invitation, which meant that he then had to continue, for longer than he had 'intended' when he started out; musically it would have been virtually impossible for him to desert me immediately, as it would have destroyed the logic of what he had just been playing (possibly, even if he actually remembered this situation, Evan would disagree about this!). I took this decision for purely musical reasons, without verbally rationalising it for myself, as it created a musical tension that developed out of Evan's initial gesture that seemed to me to be appropriate. Of course it was also typical of the way in which we functioned as a group, both musically and on the level of personal interaction (which are virtually identical, and certainly inseparable).

Had my action been on a verbal level, it could have been interpreted by an observer as being rather cruel, but it was more in the nature of teasing and at the same time intended to create a mutually stimulating musical tension. This is only possible when improvising musicians know each other well enough for a common language to have come into being, and a mutual trust in each other permits one to push against the limitations of that language and the relationships on which it is based."

Other Western traditions of improvisation involve much greater predetermined stylistic restrictions; in addition to more traditional jazz, classical music includes areas such as organ improvisations on a selected theme (which is sometimes presented to the performer in a sealed envelope) and the earlier technique of figured bass.

INDETERMINACY AND ALEATORIC MUSIC

This is John Cage's own term, and describes an approach to both composition and performance that is intended to remove his own personal taste and choice. Here we are concerned only with the latter. The performer is given the freedom of choice in the sequence of events (overall form) and/or whether or not to use certain sounds/types of sound/methods of articulation/synchronisation with other performers/equipment operators/etc. - and, if so, where and how to use them.

In most cases - once again Cage is, in certain works, the chief exception - while specifying everything that is to happen during a performance, the composer prefers not to state that one particular sequence of events is the best one, but supplies a selection of possibilities that are considered to be equally valid. Similar techniques are applied to the spectator/reader/viewer/audience in other media, such as in literature and sculpture. Drama and sculpture in particular are concerned with mobile and variable environments, audience interaction, and flexible situations.

INTUITIVE MUSIC

Once again, this is a term devised by a composer, in this case Karlheinz Stockhausen, to describe certain of his recent scores that consist only of short texts (in the set **Aus den sieben Tagen**). Similar processes can already be seen in the symbolic indications of several of his previous scores (including **Plus Minus**, **Prozession**, **Kurzwellen** and **Spiral**).

A precise formal structure is described, often rather poetically; it often includes cyclic elements, with the intention of bringing the performer back virtually to the starting point, but on a higher intuitive level (as in a spiral). The structures have a very different shape and feeling of flow and movement from those that occur in free improvisation. The performers are instructed to play in a certain way, as illustrated in the following paraphrases from the **Aus den sieben Tagen** set:

- don't play until you have stopped thinking [about what you are going to play]
- continue playing this sound until you hear its individual vibrations
- listen to all the other players together, not to individuals
- use very precise rhythmic patterns, each one clearly different from the others.

These place the musician in a very different framework of thinking and reacting from that of the improviser. Given such basic definitions to characterize a particular composition, the performers are then required to be as imaginative as possible in their interpretation, to produce music that they did not know they were capable of producing - the very opposite of drawing on clichés. Climaxes can erupt from nothing in as little as 10 seconds. Stockhausen himself is happiest when he is surprised by the imaginative qualities in the music that results, and - provided that his score has clearly been followed (which hasn't always been the case) - welcomes interpretations that are very different from those of his own performing group.

A recent example that clearly showed the distinction between intuitive music and improvisation was the first occasion on which Stockhausen rehearsed and performed one of the text scores from **Aus den sieben Tagen** with an orchestra, the BBC Symphony Orchestra. At the very first rehearsal he read out the score text and explained briefly what he felt was involved in his intuitive music. The orchestra then played. What emerged was an improvisation which lacked nearly all the basic features in the score; the music soon became orientated towards early 20th century orchestral music, such as Mahler, Debussy and early Schoenberg, which was the most modern period that all the players felt at home in. Sometimes, it seemed to me, that as soon as one or two of the instruments began to play particular patterns in certain pitch registers, other performers sensed "the right place" for themselves, and very soon a typical texture was created, somehow a blend of music from around 1910, in which every member of the orchestra knew exactly what they should be playing - but of course, this was not Stockhausen's piece at all.

After several rehearsals more than half of the orchestra had begun to avoid such familiar clichés, and were beginning to play intuitively. The resulting sound became increasingly more recognizable, both as an interpretation of that particular verbal score, and as a piece by Stockhausen.

Without using the term "intuitive", other composers have produced pieces with similar aims, also using verbal or symbolic notations. Much of Christian Wolff's music from around 1970, especially his prose pieces, come into this category. Like all of his work, these pieces have a delicacy and fragility that is all too easily destroyed, and require great restraint and sensitivity from the performers.

VERSIONS AND REALIZATIONS

A final area of freedom in composed music is the "version" or "realisation". The score comes in a semi-completed form with instructions that one or more elements (events, score pages, pitches, gestures, durations, textures etc.) must be arranged and/or interpreted in one of several possible ways by the performer(s). This is normally prepared in advance, resulting in a through-composed (often fully-notated) work which is one of several possible forms of the piece. In the large majority of such compositions, no improvisation occurs, and it is this feature of a composition that is so often labelled by the critics as improvisation.

The same can happen in the performance itself, as in Terry Riley's ensemble work **In C**. Here each musician has an identical score, a single page of notation which looks like a sequence of simple, rather unexciting-looking note patterns which are to be individually repeated; each player must play through this page in the traditional way, but chooses the number of repetitions for each short fragment and when to pause. As soon as every member of the ensemble does this independently (some moving ahead more quickly than others), the music spreads out into complex interactions of simultaneous, independent melodic lines (within a constant rhythmic framework from a high-pitched pulse), sporadically evoking, as it were, all music in C major from Bach to Stravinsky, without quoting from any actual piece of music. No player improvises and the overall flow of the music is precisely predetermined, but no two performances will ever be identical.

*This previously unpublished text (slightly revised and expanded in both 1976 and 2002) was written at a time when I first had an equal foot in both camps, contemporary classical music (especially as a member of Gentle Fire, where we interpreted many scores with freer elements, but rarely improvised freely) and "free jazz" (in Music Improvisation Company); one part of the latter developed into a third camp, that of free improvisation (slightly later I joined such a group, Naked Software). Free improvisation has expanded enormously in the last 30 years, becoming not only an international **lingua franca**, but subdividing into often unpredictable and highly sophisticated forms that are far removed from the ebb and flow structures that I described back in 1970.*

Rapid high figuration has subsequently become such a feature of Evan Parker's playing, extended with circular breathing to 15 minutes or more, that anybody who has heard him playing since the early 1970s may be surprised that at one time even a couple of minutes of such playing might have been a strain for him!

Part of a brief text of mine on Stockhausen's intuitive music was also quoted in Derek Bailey's book *Improvisation: Its Nature and Practice in Music*.

I have always tried to maintain a roughly equal balance between performing in group improvisations and in composed music (especially when it involves some degree of freedom), and I find that each fertilises the other; a similar balance between composition and performance is also necessary for me, and between composition and building instruments or sound sculptures.

New Musical Instruments (1989)

If asked, many people would say that the evolution of musical instruments stopped with the present forms of those of the symphony orchestra together with the piano, guitar and pipe organ. Newer instruments that are used in more popular forms of music, such as the electric guitar, vibraphone, saxophone family and all electronic instruments are somehow considered as temporary aberrations. In actuality, new instruments are constantly being devised, only a few of which - as always in the past - have become standardized and widely accepted. It is also likely that in the not too distant future more electrical and electronic instruments will have been built than all acoustic instruments throughout the world and through all of human history - hardly typical of a short-lived trend!

Many of the non-commercial instruments that have been invented recently, as in the past, have been designed and/or built by musicians and intended only for their personal use; in a few cases an inventor has marketed a new instrument (or family of new instruments) on a modest scale. In the last few years mass production techniques and commercial pressures have made such a traditional approach ever more difficult. In today's musical climate most instrument inventors choose not concentrate on making small improvements to a single instrument or family, but prefer to continue exploring new possibilities, often with a wide range of instrumental types; after 10 or 15 years of such work most instrument inventors are able to state that they have created more than 100 different instruments.

Another aspect of recent music has been greater freedom in composition and more interest in free improvisation, which have largely removed one problem facing the inventor of a new instrument, that of its repertoire. This has also meant that, in addition to trained and self-taught musicians, the background of some inventors of new instruments and the related area of sound sculpture are in such diverse creative fields as painting, sculpture, architecture, poetry and physics, people who for a variety of reasons have been drawn into this area of music and sound, which often involves not only the construction of the instrument but also the composition and performance of the music.

Apart from the electronic oscillator, all the basic principles of musical instruments were discovered in prehistoric times. They are very few in number, about half-a-dozen, just as - we are told - there are a similar number of basic stories or basic jokes, which has not prevented our endlessly curious and inventive species from continuing to find new forms and variants of them, even today. In our own lifetimes many new materials have become available, especially plastics, and man-made fibres, new types of glass and metallic alloys; in addition, as in contemporary sculpture, quite a number of new instruments are wholly or partly based on found and scrap materials, often used for the actual sounding object. This may initially seem strange: surely the sounding part of an instrument is particularly special? But consider the craftspeople who build harpsichords, for example; they often construct every part of the instrument themselves (even the actual keyboard), with one exception: they go out and buy the strings, the all-important sounding element (indicating that the challenge for an instrument builder is to obtain the best sonic result from the basic set of sound sources).

Among inventors of new instruments there is also an implicit rejection of traditional Western "orchestral" instruments, which reached their present sophisticated forms at various times between the early 19th and early 20th centuries, and are therefore the least suitable for substantial further improvements. With the exception of percussion instruments, and themselves largely a 20th-century phenomenon in Western music, many newer instruments tend to be, consciously or not, based on or related to the less well-known forms of Western or non-Western folk instruments (or occasionally combine features of very different traditional ones). Western folk instruments whose principles continue to be widely explored include the nail violin (in a surprisingly large number of recent instruments in addition to the toy piano), the bagpipes and the hurdy-gurdy (the doubtless unintentional basis for nearly all of the noise instruments invented by the Italian Futurist Luigi Russolo around the time of the First World War). The plethora of instruments that are used outside the areas on our planet where European music predominates puts our own traditional instruments to shame; so many wonderful sounds and possibilities have been excluded from our classical music. For example, the operatic *bel canto* style of singing that is also widespread in concert music was derived from a single folk style that was popular in part of Italy in the 17th century, and excludes many other beautiful techniques and vocal qualities.

Western composed music, especially since the 19th century, has concentrated on instruments that can be played more loudly in larger halls, blend well with each other, produce every semitone within a substantial pitch range with equal ease and timbre, and so on. Today's newly invented instruments are concerned with a reinvestigation of all of the possibilities that were excluded, featuring one or more of a range of very different qualities, all of which can be found in non-Western musics (and indeed in some Western folk musics). These include unusual tunings (especially those based on "unequal" steps, such as just and meantone intonations, microtones and no predetermined tuning system at all), capabilities for pitch-bending, glissandi, graduated noise colours, richer and more expressive timbres (more beautiful in some instances, more forcefully ugly in others), slow timbre changes, long sustained sounds and the spatial positioning and movement of sounds in the performance space. And, above all, these are instruments with more distinct "personalities", both sonic and visual; happily accepting their limitations when compared with the versatility of orchestral instruments (think how many different musical styles the piano is used in), because that all-purpose versatility can only result from a comparative blandness of sound.

*Revision of a text written for the catalogue of the touring exhibition **Making Music: New and Unusual Instruments** (Midland Arts Centre, Birmingham, 1989), only half of which was printed.*

Audio Art: Notes Towards a Definition (1992)

A performance, usually of a solo composition which allows considerable freedom to the performer, given by a musician or an artist from another medium, that involves a specially constructed, modified or assembled instrumentarium (everything from found objects to sound sculptures, and - treated in new ways - from traditional musical instruments to computer-controlled synthesizers and samplers), in which a substantial role is played by visual or theatrical elements. Audio Art also includes earlier mixed media forms such as Instrumental Theatre and - when sound or music is used as an integral part - Performance Art, as well as parallel developments such as the radio Hörspiel.

In performance the relationship between the audio artist and the audience is normally more informal, either more relaxed or more personal and participatory (even aggressive), than with conventional musical or theatrical performances. This can include the composer-performer introducing and explaining each composition verbally rather than in - or in addition to - a printed programme note.

The work of an audio artist combines three elements that are normally carried out by three very different people:

- the craftsperson: musical instrument builder or electronic designer (hardware or software)
- the composer
- the performer or interpreter

Requested by Marek Chołoniewski, composer and sound artist.

Sound Installations (1992)

In the 20th century a considerable variety of new sound sources became available to Western music. Some of these are commercially manufactured musical instruments, such as amplified versions of string instruments (especially the electric guitar, electric piano and electric violin), a wide range of electronic keyboards (electronic organs and pianos, keyboard synthesizers and related instruments), specialized synthesizer controllers for performers of wind, string and percussion instruments, and new percussion instruments. Many composers now work in electronic music studios, shaping sounds from every conceivable musical and non-musical origin into compositions on magnetic tape or digital storage device, bypassing the need for live performance, or involve **live electronic music** techniques for the real-time transformation of instrumental sounds.

However, the widest variety of new sound sources used in live performances can be seen in the work of individual composers and performers. These range from modifications of existing instruments, such as the prepared piano (devised by John Cage in 1940), performances on found and "junk" objects (sometimes amplified) that are played as percussion - since percussionists learn stick and finger technique rather than concentrating on a single instrument, to completely new acoustic, amplified or electronic instruments and performance systems - an area that is called "lutherie nouvelle" in French and "nuova liuteria" in Italian, but for which there is no equivalent in English or German. In some cases these are specified or constructed by composers for others to perform on, in other cases, especially in solo live electronic compositions and in improvised music, a single person combines the three traditionally separate roles of instrument builder, composer and performer. As in jazz, many improvisers are not trained musicians, but come from a variety of backgrounds.

A short step away from this area is the development of similar systems for presentation in art galleries, museums and public environments; both areas, concert performances and exhibitions, are often described under terms such as "**sound art**" or "**audio art**". Once again different subdivisions can be identified, and indeed these are often linked to the background and training of the individual artists. **Sound sculptures** are fixed or kinetic objects which are usually constructed by sculptors who become interested in the sonorous possibilities of their materials - if a steel wire or a resonant metal plate produce a sound, the sculptor will either ignore it, attempt to reduce it as being irrelevant, or explore methods of making it more interesting. **Sound installations** and **sound environments** are more often created by musicians and painters (who are less interested in three-dimensional constructions and gravitate more towards **performance art**, with or without sound); they are designed for a specific venue, or adapted to exploit the character of each venue, with the difference that **sound installations** visually resemble instruments or sound sculptures while **sound environments** concentrate less on the visual side and more on the activities of the public in the exhibition space. In each subdivision some constructions function automatically, regardless of the presence of the public, while others - more often sound installations and especially sound environments - depend at least partly on audience participation, whether deliberate or unintentional, sometimes offered in the form of an unusual instrument for the public to play, or a space in which their movements affect the sound.

Statement (1980)

I invent new musical instruments for people to enjoy new experiences and to increase their sensitivity to the environment of our polluted world, as a small gesture against consumerism and the tendency to throw everything away instead of recycling the waste materials of our society

I invent new musical instruments for people to enjoy new experiences and to increase their sensitivity to the environment of our polluted world, as a small gesture against consumerism and the tendency to throw everything away

I invent new musical instruments for people to enjoy new experiences and to increase their sensitivity to the environment of our polluted world, as a small gesture against consumerism

I invent new musical instruments for people to enjoy new experiences and to increase their sensitivity to the environment of our polluted world

I invent new musical instruments for people to enjoy new experiences and to increase their sensitivity to the environment

I invent new musical instruments for people to enjoy new experiences and to increase their sensitivity

I invent new musical instruments for people to enjoy new experiences

I invent new musical instruments for people to enjoy

I invent new musical instruments for people

I invent new musical instruments

recycling the waste materials of our society, I invent new musical instruments

Sounds Heard

and

Environmental Music Projects

Four Energy Sources

Human Sounds

Listen to the sounds produced by someone on a skateboard going downhill on a pavement (sidewalk) made of ridged paving-stones (used on steep slopes for better traction); the faster the skateboard is moving, the higher the pitch will be. If interest can be aroused, the skateboarder might be persuaded to vary his/her speed of descent. If no skateboarder is available, a rather less stylish substitute can be pulling or pushing a suitcase or shopping basket with wheels while walking rapidly or running.

A similar effect can be obtained indoors with plastic floor coverings which have inset grooves or raised discs. Scuffing one's shoes can also produce sounds on this softer material.

**New Cross, London, February 1976 (suitcase); Falmer, Sussex,
August 1977 (skateboard); London, October 1977 (indoors)**

Machine Sounds

Crush the silver paper from a bar of chocolate, or silver foil, into a ball (about 2-3 cm in diameter). Place this (or several such balls) at the exit end of an escalator, so that it is caught in the teeth at the end of the visible part of the belt, in such a way that the moving escalator holds it in position. An irritating sound! Remove silver paper after use!

London, November 1977

Wind Sounds

Listen to the rope or metal hawser on a flagpole, as it flaps against the pole in a strong wind. When there are two or more poles, listen to the differences that exist between their sounds. A particularly interesting sound can be found with the numerous flagpoles at London's South Bank Centre, where the flapping from flagpoles on top of the Shell Centre's two buildings (Upstream and Downstream) is reflected off other buildings (including each other, the Royal Festival Hall and the Hayward Gallery).

Bonn, May 1977; London, March 1978; etc.

The above effect can also be heard with some metal lamp-posts, when the internal power cable hangs loosely enough so that it strikes against the inside of the flexing hollow pole.

Potters Bar, March 2002

On a windy day, listen to the range of creaking sounds produced by an old-style hinged, suspended square platform number sign at a railway station. If possible stand halfway between two such signs on a single platform or on two adjacent platforms (as at the Western end of Swindon station, between platforms 1 and 3).

Swindon, July 1994

Water Sounds

Spend one night in a downstairs room in a water mill, or any other building beside a stream where part of the water is channelled beneath it. If possible, open up any method of access to the stream, such as a wooden trapdoor, so that the sound of the flowing water fills the room. Can you lose yourself in the water's sound and sleep easily? What do you dream about?

Buckfastleigh, Devon, August 1977

In 1994 this text replaced the original "Water Sounds" text, which is now included in Environmental Music Projects under the title "Tuned Waterfall".

Three Reflections on Sound

Consider the problems that blind people have as they walk around our increasingly noisy towns and cities. How much do they depend on the echoes from the sounds of their footsteps and from tapping a stick to tell them about the panorama of what to them are obstacles in front of them; how much do they need to rely on being able to hear the sounds made by other people on the same pavement (sidewalk) as themselves?

Holland, December 1977

When you cross the street, do you rely on your ears to tell you whether or not any traffic is approaching more than / equally with / less than your eyes?

Holland, December 1977

Imagine drifting alone in a boat in the middle of the English Channel (or swimming across it) in thick fog, as the melancholy foghorns proclaim the passage of ships all around you, moving slowly in all directions as darkness falls.

English Channel ferry, November 1977

Four Environments

Sounds Heard in the City

On a windy day place a small or medium-sized lightweight cardboard tube (approx. 45 cm long and 3 cm in diameter) at the top of a gently sloping pavement (sidewalk) or area of concrete, so that it will roll slowly and irregularly downhill. To produce an interesting sound it may be more effective if the ends of the tube are rough and ragged rather than cleanly cut, and/or if the tube is slightly squashed to prevent it from rolling smoothly.

London, July 1978

At a quiet time of the day or night, stand at a crossroads which has four pedestrian crossings, forming a square, as can for example be found in Sweden. Listen to the syncopations of the warning clicks when the pedestrian lights are all set at red, and walk around on the pavement (sidewalk) to change your distance from the two nearest clicking devices; notice the much faster syncopations when some of the lights change to green.

Stockholm, October 1977

Sounds Heard in the Countryside

In a wood in the early autumn, listen to the acorns falling around (or even onto) you; especially early in the morning, after a night of heavy rain, with water still dripping from the trees.

Sandford Orcas, Dorset, September 1976

Find a tree whose trunk divides just above ground level, the two parts of which cross several feet above the ground. Listen to them creak as they rub against each other in the wind, especially when they are wet, after it has rained.

Falmer, Sussex, August 1977

Sounds Heard by the Sea

Near the estuary of a small river, where its sandy shores are covered by the sea at high tide, find an "island" of sand which has not yet been covered by the incoming tide. Listen to the bubbles all around you as they escape from air-pockets in the sand, where the combined contrary flows of water cover the dry areas too quickly for the trapped air to be released immediately.

Erme Mouth, Devon, August 1977

Sounds Heard in the Mountains

Listen to the effect of an aircraft's sonic boom high up in the mountains, as it reverberates into the distance on all sides of you, like thunder.

Sion, Switzerland, September 1977

Seven Portable Found Instruments

Mouth in Wind

When a strong wind is blowing, stand at an angle to it with your mouth open; let the wind play different notes as you vary the aperture of your mouth.

Falmouth, November 1975; Hampstead Heath, London, June 1977;
Dartmoor, August 1977; Falmer, Sussex, August 1977; etc.

This is a simplified version of Sounds Heard at La Sainte-Baume No. 2.

Nut Whistles

Collect various nuts and acorns that have a small hole bored in them by an insect. Blow across the hole. Try out different nuts and different hole sizes, for a variety of pitches, producing sounds like the whistling of the wind. A similar effect can be obtained with nuts (such as filberts or cob nuts, in early autumn) that have been cracked open by squirrels, dormice or woodmice, especially when only a small part of one end of the shell has been removed; look for the rodents' feeding place, or, if the tree is on a steep slope, just below the tree (intact nuts tend to roll further downhill). Vary the pitch by altering the size of the hole with one finger.

Sandford Orcas, Dorset, September 1976



R. Davies

My collection of nut and acorn whistles has proved very useful for class projects on the weather.

Chinese Fan

The silk stretched across the frame of a cheap Chinese fan is very sensitive to heat, cold and moisture, all of which affect its tension. Play it as a finger-drum or by making a tremolo with the wooden handle between two moving fingers; lower the pitch by blowing moistly (gently, warmly) on the silk, raise the pitch by holding the fan above a heat source such as a fire or a desk lamp (or waving it in the air, or blowing coldly). Combine the two forms of pitch change for a sound like low timpani glissandi.

York, August 1970



This found instrument had its moment of glory, with very close miking, faking a timpani part in the Electroacoustic Cabaret's wacky version of Tchaikovsky's 1812 Overture; I wore a white glove on my "playing" hand to add to the ceremonial aspect of the performance. It's surprising how quite a small surface area produces such a low rumbling vibration.

Larchcone Clickers

Run each of your thumbnails along the side of a larchcone (the most effective of various types of fircone) held in each hand, from bottom to top, in a small valley surrounded by a few buildings or by rocks, giving echo reflections. Make the result sound like a clockwork machine, by moving the thumbs rapidly and independently, with much rhythmic overlapping.

Keep the larchcones for use in concerts.



La Barillette, Switzerland, September 1977

*The larchcones' main application has been in performances of my composition **Natural Images**.*

3-D Postcard

Play a three-dimensional picture postcard (or an old unwanted gramophone record; 33, 45 or 78 rpm) by running a fingernail across the grooves at different speeds. Several contrapuntal parts can be produced by using most of the fingers on one or both hands. It should be placed on a resonant or hollow surface to amplify the sound.

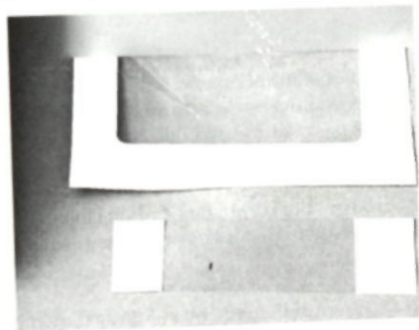


Köln, September 1970

*A 3-D postcard was soon added to the solo composition for my invented instrument, **Shozyg I**. In 1971 I planned a score that could be used as the image on a 3-D postcard, combining instrument and score in a single object, but it has never been realised.*

Envelope Buzzer

Cut out the transparent address window and two or three sides of the surrounding paper from the envelope of a business letter, forming a rectangle which consists of three parts: one edge of cellophane paper between two pieces of ordinary paper or two parallel cellophane edges with ordinary paper "handles". They can be cut out in either of two ways: "exposing" either the width of the window or its length. Hold the rectangle with ordinary paper in each hand; vibrate and rattle it, moving only one hand, or blow against the cellophane in such a way as to produce a variety of pitches and buzzing effects. Hold the rectangle in various positions for blowing, including the maximum and minimum surface areas presented to your flow of breath.



London, 1975

Lid Clickers

From the early 1990s a new safety feature began to be added to an increasing range of food products sold in glass jars with removable metal lids: a "tamper-proof" raised button in the centre of the lid (similar to the isolated note areas on the playing surface of a steel drum) that clicks reassuringly when the jar is first opened, proving that it has not been interfered with since the product was sealed in the factory. Such lids provide useful small clickers, held in the hand.

The lid is placed in the centre of one hand held flat, with the button uppermost, so that it can be played by the thumb. If the lid is positioned across the fingers with the hand slightly curved, the tips of one or three middle fingers (with smaller or larger lids) can be placed just inside the lid's rim, slightly damping the resonant surface of the lid (as can be done with the skin of a drum) and producing a somewhat different pitch.

Such lids (naturally also lids without a button) can also be scraped across or clattered on a flat surface, or spun on one edge like a coin.

London, September 2001



*Recordings of all of these found instruments, with the exception of the essentially private **Mouth in Wind**, are included on the accompanying CD. In the closely miked recordings these small instruments sound larger than life.*

Sounds Heard at La Sainte-Baume

The sounds described here from La Sainte-Baume in the south of France in mid-summer are not, of course, limited to a single location; in many other places you can find identical or related sounds. The main requirement is that you should be as far removed as possible from the noises of "civilisation".

- 1) In a forest, listen for a woodpecker. Quietly approach the tree that is being pecked, and listen to the resonances produced inside it. You may find that these are most audible with "bone-contact" - place a finger in one ear and hold the knuckle against the tree.
- 2) On the top of a mountain, when there is a substantial breeze, stand so that the wind is blowing from one side (approximately 90°-120°: the exact position must be determined by trial and error). Open your mouth and let the wind produce quiet notes as it blows past your protruded lips, sounds which are varied by opening your mouth by different amounts and thus changing its resonant cavity, as in playing a jew's harp.

Gather a small bunch of flowers or herbs or short branches, hold it close to the ear facing the direction from which the wind is blowing, and turn it gently to produce variations similar to those produced with your mouth.
- 3) On the highest mountain peak, listen to the sounds made by swifts as they race and chase around the sky, skimming the rocks, wheeling, diving, soaring, turning at the very last moment before hitting the rocks (or almost colliding with you).
- 4) Find a tree at ground level whose leaves, even when there is virtually no breeze, rustle like the sound of a stream flowing over stones and small rocks.
- 5) In the forest, especially in the very late afternoon, listen to the continuous hum of the hoverflies that are in the air all around you.
- 6) Listen to the crickets, how loud and varied their songs are. And how few and restrained are the birds by comparison!
- 7) In a small secluded valley high up in the mountains, surrounded by rock on all sides: strike two stones together in regular rhythms at different speeds, sometimes with accelerando or ritardando, relating these in various ways to the echoes you hear. Face in different directions, to vary the direction and time-delay of the echoes. Invite other people to join in.

La Sainte-Baume (near Marseille), July 1974

A simplified version of No.2, "Mouth in Wind", is included under Seven Portable Found Instruments.

Sounds Unheard

Visiting an exhibition of painting in a private house, I sat down in an empty room because I was feeling tired, and closed my eyes for five minutes. Gradually I began to feel that I was being watched; yet nobody had entered the room, since I would have heard them coming in through the slightly opened door. The feeling persisted, and when I eventually opened my eyes I saw a cat standing in the doorway, staring at me.

London, October 1974

Sights Seen

At an airport or a major railway station, stand or sit just below a mechanical departure indicator board. Look up at the moving parts as all departures are moved, one by one, to a position higher up on the board.

Heathrow Airport, London, November 1974; etc.

At the bottom of a tower block of flats or offices, which (raised on "stilts") has an open-air pedestrian area at ground level and a narrow indentation along one side (giving a brief view of the sky as you walk under it): run very quickly past this gap with your head tilted backwards and upwards. Make sure that nobody is in your way before starting, and that you will be able to keep your balance!

London, 1971

Environmental Music Projects

Singing Road (1969, rev. 1978)

This project is based on the accidental singing sounds produced by car tyres moving over certain motorway surfaces. One of the first occurrences of this was (for many years) near the southern end of the M1 motorway, a few miles outside London. The note produced can be varied by changing the speed of the car (or other road vehicle); the faster the speed, the higher the note. A stretch of the Belgian motorway E41 near Mons had (in 1978) a surface that was in places very worn down, producing a greater range of pitches without speed changes being necessary.

Road research experts would be needed to advise on the different material compositions of road surfaces that produce singing sounds, and tests carried out to verify the pitch range that resulted from each one for the normal range of driving speeds. A melodic sequence could then be created, assuming that all driving would be done at a roughly constant speed (the sequence being transposed higher or lower - with the tuning of the pitch intervals not necessarily remaining "true" - depending on the speed chosen by each driver); 2-voice chords or 2-part counterpoint could be created by treating each lateral half of a driving lane with different mixtures of roadsurfacing materials, so that the wheels on the left side would be in contact with a different melodic sequence from those on the right (motorcyclists would need a sidecar!). With two lanes, 4 parts could be composed; with three lanes, 6 parts. If a 4 or 6-part structure was composed in a traditional, tonal style, cars moving at different speeds would create strange (and possibly disturbing) distortions of the harmonies; a sudden harsh dissonance could mean that someone is overtaking at a speed only slightly faster than your own.

Acoustic Park (1975-1978)

This project should ideally be carried out in a small park in a residential area; if this is unavailable, a similar environment could be created on a derelict site that fulfils public safety requirements. The aim is an educational one, designed to make the public more aware of the sounds around them and their interest or disturbance values in everyday life. No musical instruments or sound sculptures would be installed in the park; the sounds would be produced primarily by people walking through the space, as well as by wind and water. The construction of the environment should if possible be done by local people, and not by musicians or artists, and it is hoped that the following suggestions would be used primarily as models to stimulate members of the construction team to think up their own contributions on similar lines.

- a route through the park should be tacitly indicated by some sort of path, perhaps winding in and out to make greater use of a small space
- parts of this path could impose different sound qualities on footsteps, by using different surfaces (gravel, pebbles, stones, bricks, tar, and various mixtures of these) and in places containing hollow areas beneath the surface (covered especially by wooden planks, with different surface coatings), to alter the resonance of the sounds
- walls could be built at certain points, parallel to the path, to reflect the sounds of footsteps; this could be made particularly prominent by following a long non-reflecting section with a wall on each side, so placed that the first reflection from one side stops after two or three steps and is replaced by one from the other side; this should have a similar effect for people walking in either direction
- a wall could have keyhole-sized holes in it, which would whistle when there is a strong wind; careful study should be made of the directions in which the wind blows most frequently at that spot, so that the holes or sections of wall can be angled appropriately
- ponds or lakes and mounds or small hills should be used to affect and screen certain areas from others; it might be possible to create a central area where sounds from all around could be heard, and others which are unnaturally silent

see also Tuned Waterfall opposite.

Tuned Waterfall (1973)

Tune a small waterfall using large stones and small rocks, placing them in various arrangements at the lip of the waterfall for different results; a long line of stones will give many subdued sprays of water, larger groups with larger intervening spaces will concentrate the water at certain points, with strong jets only at the sides or only in the middle (for example); various combinations of these can be used. A quicker and more predetermined method would be to construct a selection of simple wooden barrages, gates which each have a different arrangement of "teeth" and gaps, which could be lowered into position individually.

Aynho, Oxfordshire, August 1973

"Tuned Waterfall" was originally included in *4 Energy Sources* under the title "Water Sounds"; in 1994 it was replaced by a new "Water Sounds" text.

Environmental Recording Project (1977, rev. 1980)

The participants are divided into at least three small groups. Each group has a portable cassette tape recorder, and is asked to collect five sounds within a limited period of time (usually between half-an-hour and an hour). These must all be found within a specific environment which has contrasting sounds, such as a shopping centre or the buildings and grounds of a school, college or university.

Each of the five sounds must last for at least a minute, and embody one of the following definitions, which are deliberately subjective and emotive (since these definitions are not mutually exclusive, some of the sounds may also contain elements of one or more of the other definitions):

- a sustained sound
- an interrupted sound
- a beautiful sound
- an ugly sound
- a sound with a quality to be decided upon in advance collectively by the participants (e.g. loud, too loud, soft, too soft, disturbing, inappropriate, confused, isolated, etc.)

When all the groups have reassembled with their recordings, the sounds of each group are played back, and their suitability for the chosen definitions is discussed. Finally - and this is in some ways the most important (though unspoken) aspect of the whole project - all the sounds that were gathered for each definition are played back simultaneously. Thus the beautiful sounds, while beautiful in themselves, can together easily create a familiar or even corny result (birdsong, the drip of a water tap and a guitar being strummed will evoke the image of someone playing a guitar on a riverbank on a sunny day), whereas the ugly sounds are likely to combine into something that is much more vital, exciting, unpredictable and unexpectedly musical.

This "sting in the tail" surprised me the first time, but I soon realised that it brought a vital ingredient to the project.

My Environmental Music (1994)

Since the late 1960s my strong interest in the environment and in wildlife has been reflected in my music. In 1974, as part of a radical reassessment of my already modest lifestyle, I became a vegan (strict vegetarian). Beginning in 1969, I have compiled a collection of written environmental sound documentation (**Sounds Heard**) and several environmental music projects. My first composition related to wildlife songs was the tape composition **Natural Images** (1976), which was originally composed for a modern dance work of the same name by Royston Maldoom; this in turn was based on a shorter workshop collaboration in which the choreographer and I performed the music live on acoustic and amplified plant materials, stones and pebbles, while I had choreographed one section of the dance. These and other concrete and electronic sounds were further processed in the tape version, to evoke but not imitate the real songs and related sounds. In 1992 I combined and extended elements of the original live piece as a solo performance to accompany the tape. The plant materials also formed the basis of my instrumentarium in 1982 when I performed in John Cage's **Branches** (also dating from 1976).

Environmental elements can be found in several of my earlier compositions. **Music for Car Horns** (1967-69), which is still unperformed, was intended for performance in a large car showroom or outdoor space. I used slide projections of seaweeds as an element of the notation for musicians and dancers in the music theatre work **Beautiful Seaweeds** (1972-73), while a solo music theatre piece, **At Home** (1978), uses acoustic and amplified domestic objects - including a home-made sheep-dog on wheels which is taken for a walk. My poem for **Haiku** (1974) describes the silvery effect of recent early morning winter rain on the branches of a tree. The apparent environmental implication of other titles from this period are, however, misleading: **Kangaroo** (1968) for organ only compares the player's actions to the animal's leaps, while the specially-built instrument used in **Spring Song** (1970) is based on metal springs, and the found-object instruments in **Salad** (1977) are egg, cheese and tomato slicers!

A new aspect of my environmental music involving traditional instruments began in 1978 with **Meldoci Gestures** (named from a delightful misprint in a music journal), in which various exotic wildlife songs were recorded on tape and played back at a different speed - up to four octaves higher or lower and sixteen times faster or slower - in order to bring them into the range of human music in both pitch and speed, and were then transcribed for an instrumental trio. **Meldoci Gestures from the British Isles** (1979) rectified an unintentional omission in the earlier piece by using exclusively British wildlife sounds, and in 1981 the same process for the selection and transposition of the musical material was applied to sounds in my personal environment, forming a substantial part of **Rapport**.

A further music theatre composition, **I Have a Dream** (1984-85), applies part of a phrase from a famous speech by Martin Luther King about the situation of black Americans to the way in which humans similarly regard animals as an inferior species: a strange unknown being emerges from a human-shaped cocoon and lives through its life-cycle. Whale songs, already used in different ways in **Natural Images** and **Meldoci Gestures**, reoccur more recently, played on different objects by superball mallets, in **Master Domenico's Humpback - Interrupted Tango** for piano (1983) and **Strata** (1987). My other favourite animal song, that of wolves (also used in the same two works from the 1970s), is intended as the basis of a long-planned work for several trombones (or cellos), in which the composer would act as an imaginary musicologist in a future when wolves have become extinct, trying to recreate their music from a single surviving recorded fragment.

This text was originally written in the third person, for a festival programme in Bratislava, when several of the cited works were performed; others can be read about in this book.

DANGER !
MODERN MUSIC

The first of these is the fact that the music is not only a reflection of the times, but also a reflection of the people. The music of the 1920s and 30s was a reflection of the American people, and the American people were in a state of transition. They were moving from a rural to a more urban life, and they were moving from a more conservative to a more liberal life. The music of the 1920s and 30s was a reflection of this transition, and it was a reflection of the American people's desire for a more modern and more liberal life.

The second of these is the fact that the music is not only a reflection of the times, but also a reflection of the people. The music of the 1920s and 30s was a reflection of the American people, and the American people were in a state of transition. They were moving from a rural to a more urban life, and they were moving from a more conservative to a more liberal life. The music of the 1920s and 30s was a reflection of this transition, and it was a reflection of the American people's desire for a more modern and more liberal life.

! DANGER !

The third of these is the fact that the music is not only a reflection of the times, but also a reflection of the people. The music of the 1920s and 30s was a reflection of the American people, and the American people were in a state of transition. They were moving from a rural to a more urban life, and they were moving from a more conservative to a more liberal life. The music of the 1920s and 30s was a reflection of this transition, and it was a reflection of the American people's desire for a more modern and more liberal life.

MODERN MUSIC

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Simple Invented and Found Instruments

The Eggslicer (2002)



An intriguing image in Alfred Bester's 1956 science fiction novel **Tiger! Tiger!** ("The Stars My Destination") is of a spaceman marooned in the wreck of a spaceship, who whiles away the interminable hours by plucking simple melodies on an eggslicer.

Other colleagues in Britain began to use the eggslicer as a musical instrument in the late 1960s before me, sometimes amplifying them with a contact microphone. As far as I know, I was the first to amplify them with a magnetic pickup (as in an electric guitar), which extracts a wider range of sounds from them - including longer sustained tremolo sounds when the eggslicer is laid flat across the pickup and gently pushed at one end, so that it rocks back and forth for several seconds. The latter lasts longer when the rim of the pickup (taken from an old telephone) is filed down in places, and different positions give different timbres and vibration speeds.

At any one time several varieties of eggslicer can be purchased; they have either 8 or 10 strings. In my own experience the best of all were the models I started out with, made in the former German Democratic Republic (perhaps the steel content was greater?); for many years I continued to buy an example of every model I saw in a shop, but none of the others were quite as good. Some performers, like me, separate the plastic or metal eggholder (which contains long slots into which the strings fit when the slicer is closed) from the rectangular harp-like frame, others retain it for additional resonance and as an extra sound source. The frame itself can be struck, with the strings adding resonance; if it is held in the hand, squeezing the two long sides increases the tension of the strings and produces higher pitches when they are plucked or struck.

Naturally the manufacturers are not concerned with tuning, and the string tension is usually sufficiently irregular to produce a set of mostly different pitches; it is, however, possible to retune some strings slightly by pushing hard on them (for a lower pitch) or on an adjacent one (for a higher pitch).

Early in the 1970s I attempted to build a triangular equivalent of an egg slicer, with strings of different lengths, but without proper machinery I could never succeed in maintaining all the strings at sufficient tension while I was fixing them in place.



Subsequently I found two other "relatives" of the egg slicer among other kitchen utensils: the tomato slicer (with miniature saw-blades instead of strings, and a wooden handle) and one variety of cheese slicer (with a single cutting wire mounted across the front). Guess who composed a piece called **Salad**, using a selection of all three kinds of slicer, amplified with a set of four magnetic pickups!

Eine kleine Eierschneidermusik (Egg slicer Quintet) (2000-01)

group improvisation by Johannes Bergmark, Adam Bohman, Hugh Davies, Martin Klapper, Mats Lindström

A recording of **Eine kleine Eierschneidermusik** is included on the accompanying CD.

This is the most "professional" track of all on the CD, created with one of the simplest sound sources. It was also the most complex to organise, as it involved international cooperation, attempting to recreate an egg slicer ensemble from a sextet concert at the Copenhagen International Experimental Festival in 1998. Layer 1 was recorded on a DAT cassette by Johannes Bergmark and Martin Klapper in Copenhagen, Mats Lindström added his layer to the DAT in Stockholm and sent the result to me in ProTools format on a CD-ROM (so that I could balance each of these three tracks individually), before Adam Bohman and I added our layers in London. In remixing the final quintet, nothing was omitted. Mats' contribution, as I warned him it would be, was musically the most difficult layer, not only responding to the original duo without another live performer, but also trying to "leave some space" for the final duo. [The sixth member of the original egg slicer ensemble in Copenhagen, Jindrich Biskup, subsequently moved back to Prague, and it was too impractical to ask him to participate.]

layer 1: Johannes Bergmark (left) / Martin Klapper (right)

layer 2: Mats Lindström (centre)

layer 3: Hugh Davies (half-left) / Adam Bohman (half-right)

To illustrate how such an everyday found object can be played in so many ways, each musician kindly answered several questions. Here is a summary of their responses.

1) how many egg slicers did you use?

Bohman and Lindström: one; Klapper: two; Bergmark: three (one without any strings); Davies: five.

2) have they been modified or prepared by you in any way?

Bergmark: one has no strings, and some strings on a second one are loose; Bohman: a small piece of polystyrene was inserted between 4 strings and used like a guitar bottleneck (his slicer is still attached to its original plastic holder); Davies: sometimes prepared with a thin metal diaphragm disc or a spring; Klapper: no; Lindström: prepared with a spring.

3) were they acoustic or amplified? If amplified, did you use contact microphones/magnetic pickups /other pickups?
All were amplified (the models were all different). Bergmark and Bohman with a contact microphone; Klapper and Lindström with one old magnetic pickup, Davies with two, plus a contact microphone (when he briefly blew on one egg slicer). Bergmark's stringless egg slicer was part of his instrument Whalefish, and his two free egg slicers were held against the instrument in order to be audible via its built-in contact microphone.

4) did you use any live electronic treatments? If so, which?

Only Bergmark: tube (valve) distortion box, and Lindström: multi-effects box for electric guitar.

5) what playing methods did you use (like plucking, bowing, striking, blowing on, etc.)?

Bergmark, Bohman and Klapper: plucking, bowing and striking; Davies: plucking, bowing, striking and blowing; Lindström: plucking. Among various small implements, Bergmark included bowing with a feather, striking with a screw and rubbing the strings with sandpaper; Bohman's arsenal consisted of a glass rectangle, a large dented marble, a cylindrical grindstone, a wooden rod, a plastic knife, a wire brush (like a toothbrush), a round file, the polystyrene and a razor blade; Davies had a needle file, a small nylon-haired brush and a plastic toothpick; Klapper's "usual set of tools" featured a plectrum, nail files, coils and springs; and Lindström "scrubbed" the spring with his thumb to produce bass sounds.

6) did you play only egg slicers, or anything else?

Bergmark: the stringless frame on Whalefish, and a spring on the instrument was struck accidentally; Davies and Lindström: the preparations also contributed their own sounds in combination with those of the egg slicer.

Squeakbox (1969)

Toy squeakers containing a metal reed come in two basic types. The first consists of a short cylindrical plastic reed holder (of which many years ago I was able to buy two different sizes/pitch ranges), and must have been intended for any toy that featured a flexible, squeezable hollow plastic or rubber container which could act as a bellows. In the second type, which I have always thought of as doll squeakers, a reed is incorporated in a miniature plastic bellows, so that it could be fitted inside softer dolls and other toys.

Between 10 and 12 doll squeakers of the second type, with contrasting pitches or quality of squeak, are placed inside about half of the separate compartments in an alphabetically labelled 20-part accordion file, and in different positions within the compartments.

Play like an accordion ("squeezebox"); also vary the part of the file that is squeezed, to activate the different positions of the squeakers.

A second version (1975) completes the circle of titles: the normal reeds of a damaged or cheap piano accordion (or concertina or bandoneon) are removed and replaced by doll squeakers of the first type.

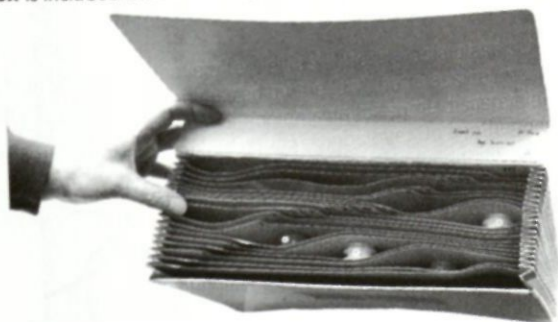
Individual squeakers of the first type can also be fitted into the nozzle of certain empty squeezable household containers; my favourite is the lemon-shaped yellow plastic dispenser of lemon juice (the smaller sized squeaker fitted perfectly). Different modifications of the basic sound can be achieved by cupping one's free hand around the nozzle and by leaving the nozzle-cap loosely screwed into place.

Following a two-year period as the assistant of Karlheinz Stockhausen (1964-66), I moved to London at the end of 1967. The composer Annea Lockwood became a close musical friend and colleague, and it was she who first showed me the doll squeakers she had found in a local toyshop, far removed from the avantgarde context I had largely worked in beforehand - or perhaps not so far after all. **Squeakbox** is dedicated to her.

When it was new I showed **Squeakbox** to another friend and colleague, the Hungarian composer, pianist and conductor Peter Eötvös, who was immediately able to conjure something out of it with a Hungarian flavour.

Although I have not investigated what is currently available in toy shops, I imagine that such squeakers have been largely replaced by electronic chips with sampled speech sounds. Certainly it has become increasingly hard to find any electrical or other surplus store or mail order company of the kind that formerly offered such exotic items for sale. After a couple of early disappointments I long ago decided on a policy of buying a lifetime's supply of such cheap and basic items.

A recording of **Squeakbox** is included on the accompanying CD.



Eargong (1973)

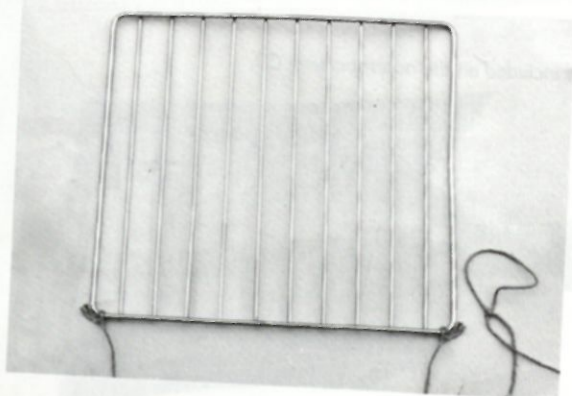
private instrument: a found metal object, typically a rectangular oven grill with several crossbars (resembling harp strings); a length of string is tied to each of two adjacent corners, or two simpler objects are selected, each with a single length of string

Twist each loose end of string around one of your index fingers (or tie a small loop in the string and insert the index finger), and place each finger into your ear on the same side of your body. Incline your head forward to allow the eargong to hang freely in front of you, at about knee height. Let it swing back and forth, hitting against (sometimes hit by) your knees, and against other objects (wood, metal, plastic, glass, etc.). Soft and padded surfaces can be used to damp parts of the sound spectrum. Vary the way in which the eargong swings against each object, and the amount of time that elapses before making the next sound. Vary the stereophonic effect by removing one finger at a time from its ear, alternating the removal of fingers from ears (different speeds and rhythms) and varying the amount of finger removal. Make a musical performance for yourself with it (as a "private" instrument; what you hear is much richer than the tinny noises that are audible to anyone who is nearby). Hang small resonant objects from the eargong. Use two or more eargongs together. Sometimes invite another person to perform on the eargong for you, using small objects such as pens, pencils and screwdrivers (a crystal drinking-glass drawn very slowly along the crossbars of a grill is especially beautiful). Play an eargong duet with another person, swinging the eargongs so that they strike each other. Each time try to find new sounds, new surfaces. Enjoy yourself. Surprise yourself. Make eargongs from other found objects.

The idea of the eargong appears to have been the discovery of Christopher Woodman, as demonstrated to me by Richard Orton. It has become integrated into my own work of inventing and discovering new musical instruments. The grills that I usually use have proved to be the most effective eargongs, and have the added benefit that it is possible to buy them in sufficient quantities, rather than contradicting the idea of a found instrument by having them specially manufactured.

This text was originally written for the poster that accompanied each eargong in a limited edition of 100, published in autumn 1975 by Henri Chopin as Collection OUt No. 4. Apart from oven grills, my favourite eargongs include the toothed driving sprocket wheel from a bicycle; another of my eargongs, which was made as an instant response to a request for an instrument from a young child, consists of a simple metal coat hanger with one length of string attached.

Due to the private nature of all eargongs, which are extremely difficult to record accurately, no recording has been included on the accompanying CD; please make your own and enjoy that instead.



Lady Bracknell (1974)

This toy instrument is named after the famous character in Oscar Wilde's play **The Importance of Being Earnest**, related especially to her immortal response "A handbag?", and its evocative drawn-out enunciation by Dame Edith Evans.

With a drill bit between 1.5 and 2 mm, bore a small hole in the centre of the base of an empty tin (diameter and height both between 7.5 and 10 cm), such as for ground coffee; file smooth any rough edges around this hole. Cut approx. 1.5 m of monofilament fishing nylon (breaking strain at least 12 kg), knot one end tightly around a used matchstick and thread the free end through the hole from the inside. The result resembles half of a child's "tin-can telephone". If there was an original plastic lid for the tin, it should be reused, with the nylon line stored inside the tin when not in use.

Among various possible playing methods the most satisfactory is to sit on a chair with the tin placed on the floor with the open end underneath, gripped between ones shoes or with the toes of one shoe raised so that it rests on the rim of the tin. Holding the free end of the string tightly in one hand (if necessary wrapped round a small piece of wood or other object), rub the string with the wettened fingers of your other hand. As it is an instrument that I do not share with others, I use my own saliva, but an accessible small container with water may be found preferable. In my experience as a left-hander, I hold the string with my right hand and rub it with my left, supporting the tin with my left foot, thus preventing the string from being damped by my left knee.

Different degrees of pressure and the number of fingers used (normally the thumb opposed to the first two fingers) can produce a range of sounds from chickens to gently mournful wailing (especially when accompanied by an appropriate facial expression and body language). The single foot position enables the performer to angle the far side of the tin away from its flat position to about 45 degrees off the ground, creating a wawa-type effect.

A full-scale sound installation that uses the same materials and performing principle, **Room Harp (web)**, is described elsewhere in this book.

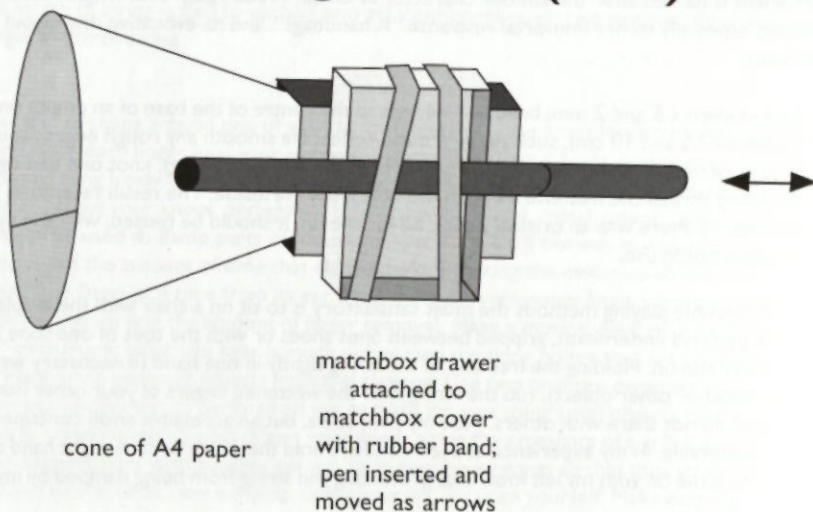
The first description of **Lady Bracknell** was published by my friend the Canadian-Irish poet sean o huigin, in his book **Poe-Tree: a Simple Introduction to Experimental Poetry** (1978).

Recordings of **Lady Bracknell** and **Collective Responses** (played on **Room Harp (web)**) are included on the accompanying CD.



CONFERENCE INSTRUMENT

Hugh Davies (1976)



Materials: empty matchbox, rubber band, pen (felt-tip/ballpoint) or pencil, A4 sheet of paper - all found on a typical conference table!

Wind the rubber band twice (one twist) around the interior tray of the matchbox. Insert the exterior matchbox cover between the base of the tray and the doubled rubber band, turned through 90° from its normal alignment. Insert the pen or pencil as a movable bridge across the two longer sides of the matchbox tray, between its rim and the rubber band. For somewhat greater loudness (and to enable others to hear the sound adequately), roll up a sheet of A4 paper into a long, narrow cone shape and insert its apex into one of the open ends of the matchbox cover.

Performance technique: pluck the "strings" or gently move the pen/pencil laterally backwards and forwards across the rims of the tray (holding it at the opposite end from the amplification cone). For the greatest satisfaction in private listening, hold the instrument close to your ear or to that of a colleague.

The original stimulus for this instrument came from the Argentinian-Canadian composer Alcides Lanza, when I sat next to him at a conference in Bourges, France.

A recording of **Conference Instrument** is included on the accompanying CD.

developed from an idea

(of A. Lanza)

interf.

:- matchbox, rubber band, pen or pencil

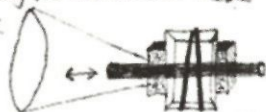
- wind rubber band twice around the interior portion (tray) of matchbox
- insert exterior portion of matchbox ~~between~~ ^(cover) between recess of the tray and the doubled rubber band, turned through 90°
- insert a pen or pencil ^{as a bridge} between the rim of the tray and the doubled rubber band
- performance: pluck "strings"; move pen/pencil laterally backwards and forwards

aw.

Thurs solo (Wed night set up)

Thurs Interfaces equipt. & props:

always holding the instrument close to the ear.



Songs, 7-6-76

if available the base of certain types of floor-standing ashtrays could be used as a stand for the instrument when not being played.

Greater amplification, to enable more than one person to hear the notes, can be achieved by rolling a sheet of paper into a cone and inserting it to peak into the instrument.

Sound Installations and Related Projects

Collective Responses (1981)

sound installation, to be performed by members of a concert audience

The composer's sound installation or environmental instrument **Roomharp** (1970), or its revised formats **Wall Harp** (1981) and **Room Harp (web)** (2000), is installed in an appropriate space in or close to the room in which a concert is to take place. It consists of a three-dimensional web of monofilament fishing-nylon strings, mounted on one or more walls, whose sounds are acoustically amplified by means of unusual resonators (see notes below).

The layout of the sound installation depends entirely on the wall space that is available. Between 15 and 30 people will be able to perform simultaneously. In order to accommodate larger audiences (or at least those audience members who wish to participate actively), it may be necessary to instigate a shift system whereby a performer stops after a predetermined time and is replaced by somebody new.

Collective Responses can also be performed as a solo or duo, or by a small ensemble.

The strings are played by rubbing them with wettened fingers - for which several containers of water are placed at strategic positions on plinths or on the floor. Different degrees of pressure and the number of fingers used (normally the thumb opposed to the first two fingers) can produce a range of sounds from chickens to gently mournful wailing. The performers hold in their free hands a small, preferably hollow, object that is placed lightly against one end of the string to amplify its sounds; if this is placed more centrally on the string it will damp or even "stop" it, producing a higher pitch.

A brief demonstration and rehearsal will be necessary immediately before the performance; this can be simplified if several performers have tried out the performance techniques in advance, so that each of them can assist a small group of audience members.

There is no notated score and no additional performance instructions; the nature of the instrument and its performance techniques is sufficient.

*A portable toy instrument that uses the same principle, **Lady Bracknell**, is described elsewhere in this book.*

Room Harp (web) (1981; new version 2000)

Minimum wall area needed: 4.5 x 3 m.

Parts of the installation must be fixed to the wall, in approx. 20 places.

One or two sculpture plinths (approx. 30 x 30 x 80 cm high) will be required.

My sound installations create a three-dimensional space inside the gallery-room with quite small, often everyday objects, often involving some degree of remote control; they only really come alive when members of the public are performing on them and interacting with each other. Although they are not primarily built for children, young people particularly enjoy the element of participation - especially in galleries and museums, where visitors expect to see signs that request "please do not touch". **Room Harp (web)** has gone through three different stages. Like all my work for exhibitions, it makes no sound unless members of the public participate; untypically for me, this installation is entirely acoustic.

Room Harp (web) includes at least three special acoustic radiators/resonators which amplify the sound. The principal one is fixed centrally, high up on the wall, and is mounted at the front of a protruding "arm" through which the longest strings are mounted, harp-like. Partly interconnected with this are two circular webs on or just in front of the wall, one on each side of the centre, each with its own central resonator (such as a saucepan lid with a red or blue conical horn fixed to its centre). The plinth is placed centrally against the wall; on it is a small white plastic bowl containing water, which should be washed out and filled with clean water at least once a day (depending on the number of visitors). The visitors dip their fingers into the water before rubbing (= bowing) the strings. A notice on each plinth reads:

*Dip your index finger and thumb into the bowl of water
and rub any of the strings with them.
Discover the most suitable performance techniques
for producing different sounds and articulations!*

Comments from a visitor's book, mostly by children:

- I want to have a harp in my room. Fantastic!
- I liked the bit when we wet our fingers and we played the strings it made a nice sound.
- I love the Warter harp ...the Day was the Best Day of my Life.
- It was really fun! Especially the Room Harp.

The title also refers to the venue for the first performance, the original space of the London Musicians Collective.

Recordings of **Collective Responses** and **Lady Bracknell** are included on the accompanying CD; the composer Julia Usher kindly agreed to join me in the former, playing on a sound installation she had only briefly tried out beforehand, on the day when we met for the first time.

Cascadenza (1981)

proposal: environmental music project for a fountain in a city environment

Fountains are normally concerned entirely with water, and its interactions with light. This project adds sound and the other three elements: earth, air and fire.

The ideal location for such a fountain would be in a large indoor open space, for example in a new shopping centre on two levels; the fountain would extend from the ground floor to above the balcony on the upper level.

The sonic elements could include all the four basic categories of instrument: wind, string, percussion, electronic:

- sequences of tuned pipes that are sounded when the water flow forces air through them
- water flows across "harp" strings, attached to one or more resonant bodies
- pivoted cylinders fill up with water, tip over and strike a rock when empty (as in some Oriental gardens and irrigation systems)
- water falls from different heights onto metal plates, set at different angles to the vertical
- slow water drips fall from great heights onto a pool of water
- lights shine through the water, affecting photocells which vary electronic oscillators
- tuned waterfall (see **Environmental Music Projects**)

A water-powered turntable could select different combinations of the sound and other aspects. Steep spiral water channels at certain points (with transparent surround) could increase the flow of water, and shallow (even upwards) slopes reduce it

Earth: sand flow

Air: pumped air

Fire: hot-plate (as in an electric cooker) on which water drops evaporate; the steam might rotate lightweight vaned sound mobiles

Falling sand, pumped air and rising steam affect the lighting; small mirrors and shiny rotating metal mobiles reflect it.

This unrealised project is the one I would most like to work on, assisted by a multidisciplinary team.

Shop Window (1979)

As an extension of the desire to affect the actions and responses of members of the public by means of muzak in shops and other public places, in recent years there has been a growing tendency for many of the trendier shops aimed at young people, especially clothes and record shops, to play loud music (often featuring the mind-numbing mechanical beat of drum machines) through loudspeakers that face the entrance door, or are even placed outside it. Some car drivers play similar music very loudly while driving with the window open, so that it can be heard clearly while driving past pedestrians and private homes (sometimes even louder than music being played inside), and workers on building sites or rebuilding and repainting older houses seem unable to work without a transistor radio set at a high volume level. There must be many people who resent such aural intrusions but are unwilling or even afraid to complain, since the offenders are often abusive in return (claiming their freedom to do as they like, while denying an equivalent freedom to others); yet very few of those who impose their "choice" of music on others are actually listening to it, and would often be unable to state the title of the previous song and/or its performers, let alone to sing any of it.

The present project is an attempt to make the public more aware of their fundamental right to choose individually what music they listen to - and indeed whether or not they wish to hear music at all - in the same way that their right has been recognised not to be disturbed by a variety of other unsociable activities that are more tangible, such as chemical pollution, offensive smells and industrial noise. Apart from this, it is probable that in some countries such public "broadcasting" of other people's copyright material without a performing rights licence is actually illegal.

This project allows both the artist and members of the public to play their own sounds into the street and to design sounds that are less (sometimes probably more) offensive than indiscriminate loud rock or rap music. The artist will work for 4-6 hours during weekdays in the window display area of a shop. Everything the artist does can be seen by passers-by. Requirements include a chair and two small tables, with electronic equipment supplied by the artist. The project involves attaching small electrical transducers to the glass of the window, converting it into a large loudspeaker. One or two adjacent windows can be used in this way. Two kinds of sound can be heard on this/these loudspeaker(s): sounds brought to the shop by members of the public on cassette tapes or CDs (sounds produced and recorded by them, but not copies of commercial recordings or broadcasts), which will be played at publicised times, and sounds created by the artist. The window will not function completely as a "hi-fi" system, as it will modify/distort/resonate the sounds and possibly add unusual qualities to them. Various additional objects, especially ones which include a rubber suction "sticker", will further modify the way in which the glass resonates the sounds.

The artist's sounds will consist of the following:

- quiet electronically-generated sounds produced by simple circuits which the artist will build when nothing else is happening, performed by him at publicised times
- all the sounds produced from the experimentation with and construction of the circuits, both the electronic sounds and the amplified sounds of the table and tools on and with which the work is done (making externally audible all the sounds in the normally silent display area)
- short performances at publicised times on electroacoustic instruments invented by the artist

The artist will document these activities and pin up progress reports, performance announcements, comments on the outside world as seen through the window(s), etc. During the short periods when the artist leaves the display area (for food, drink, toilet, etc.), a notice will be displayed in the appropriate language which contains a deliberate error (actually seen in a shop door in London):

Back in a few minuets

Ich komme nach einige Minuetten zurück

Je reviendrai après quelques menuets

Proposed for a festival in Vienna, but not accepted. I have nothing against rock music (there doesn't seem to be an all-embracing term that covers all of today's different approaches), though my tastes are now rather old-fashioned, and I find African rap musically much more interesting than the urban variety we have in Western countries. My disagreement is with those who impose their often insensitive musical choices on others.

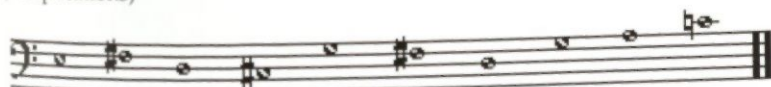
Tuned Staircase (1972)

A short staircase, straight or (preferably) spiral has approx. 10-15 tuned wooden treads installed, like a giant xylophone. Each tread produces a different pitch through differences in the thickness of the wood and/or by some of the treads being hollowed out underneath. The treads are fixed to the metal framework by means of a pair of large bolts mounted near each end of the treads and - to minimise the damping of their vibrations - supported by thick, dense rubber pads between the treads and the framework (in a similar position to that used to support the bars in xylophones, chime bars and other metallophones). Metal treads are also possible, but are less easy to achieve, as the lowest-pitched treads would require substantial metal weights attached underneath.

The tuning of the treads should be designed and arranged so that a (reversible) melodic line is produced when a person walks up or down the staircase, with no more than one-third of the pitches duplicated (ideally no pitch should occur more than twice, and octaves should be avoided; see the examples below). The melody should have a tendency to rise or fall that is opposite to the direction in which a person is walking. In addition to such normal use, one or two agile musicians (such as percussionists) wearing clogs could create a performance, in which - in addition to normal "step-wise" movements - considerable rhythmic variety and some "leaps" would be included; such physical leaps would produce a different mixture of adjacent pitches and sometimes pitch leaps, so that the performer(s) should know the tuning sequence by heart, perhaps marking each tread with its pitch name or some form of colour-coded stickers.

Sample melodies

10 STEPS (top to bottom)
(2 duplications)



15 STEPS (top to bottom)
(5 duplications)



(transpose ad lib. to an appropriate pitch range)

This was proposed for a major festival, but various events made the planned construction of this staircase impossible. One could imagine Stomp performing on it with panache! I have recently started to describe as "programmed" instruments those in which the pitches are arranged melodically rather than in a scale.

DANGER - MODERN MUSUC

SCORES

Moonlight (1964)

original instrumentation: muted trumpet, Eb alto saxophone, muted trombone, accordion, electric guitar, suspended sizzle cymbal

Moonlight was originally composed for a (somewhat sinister) moonlit scene in a play. An independent performance should use appropriate lighting to suggest this atmosphere, and dance or mime could be added to reinforce it: slowly changing, serene, exquisite, mysterious, perhaps slightly menacing and unearthly. The overall effect should be that of a dream.

The accordion and/or electric guitar may be replaced by other chordal instruments.

This piece is entirely based on a single chord:



It is of indeterminate length, and is played in a tempo of $\text{♩} = 30-36$, with the following restrictions:

The trumpet plays only three pitches, sounding



and written



with the lowest one the most important.

The alto saxophone plays only three pitches, sounding



and written



with the middle one the most important.

The trombone plays only three pitches:



The accordion and electric guitar play only four chords:



The cymbal adds discreet background sounds.

The duration of the piece is determined solely by requirements, dramatic or otherwise, but should normally be between 2' and 5'. The overall dynamic level is pianissimo, with a gentle crescendo to a central point and diminuendo back again, provided that a simple arch-shape conforms with the context, as well as many very small crescendi or diminuendi on longer sustained notes (as in the music example below). The whole piece is to be as static as possible. Its realisation consist of the

players freely selecting from the notes allotted to them, changing only on the slow-moving beats of the tempo (a conductor may be required, at least for rehearsals); no note values are to be less than a single beat (duration approx. 2 seconds). Notes or chords should generally be held for several beats, but the texture must alter freely, kaleidoscopically; avoid any regular rhythm of the notes changing, both individually and in the ensemble. Vary the selection of successive notes or chords, and only rarely repeat a note or chord for a second or third time. All the changes, playing a new pitch, repeating the previous one or taking a rest, must be stealthy and almost imperceptible (fade in and out). Each player should be silent for about one-third of the performance.

Guitar tremoli (for longer chords) should be kept to a minimum, as no instrument should become too prominent in the texture; alternatively fuzz may be used to create a longer sustain. Similarly, chords should never be spread, to avoid prominence and interruptions to the smooth flow of the piece. The F natural of the trumpet and alto saxophone is the most prominent note, and the most poignant one, in the setting, and should occur somewhat more frequently than the others. Progress up to a mini-climax, however slight, can be heightened by a gradual increase in the occurrence of the trumpet's highest note, beginning as the least frequent of all the pitches and ending with an equal importance to the rest. Further play may be made of the only adjacent semitone, between the lowest trumpet/middle saxophone pitch and the highest trombone one.

A possible opening for the piece indicates some of the points mentioned above:

Trumpet

Alto Sax.

Trombone

Accordion

Music for Car-Horns (1967 rev. 1969)

This work should be performed with at least 15 cars (one performer for each car), preferably in the open air, such as in a large car park, a street which has little traffic, or else indoors in a large, spacious car showroom (my original inspiration was the Renault showroom in the Champs Elysées in Paris, in the spring of 1967).

The car horns/hooters, preferably of the older type operated by squeezing a rubber bulb, must be capable of playing a single sustained note, and the total of their pitches should cover a range between a minimum of a minor thirteenth and just over (but not exactly) 2 octaves. The interval relationships between the different hooters must include the following (a single hooter may, of course, appear in two or more of these categories):

A. 3 hooters of identical pitch (unison; no other unisons are to occur between the remaining hooters)
OR

B. 2 pairs of identical pitches, with a dissonant interval between the 2 pairs; e.g. minor or major second, seventh or ninth, or a tritone (no other unisons are to occur)

C. 2 pairs of octaves (one pair may be 2 octaves apart), which are of medium consonance; e.g. minor or major third or sixth (no other octaves are to occur)

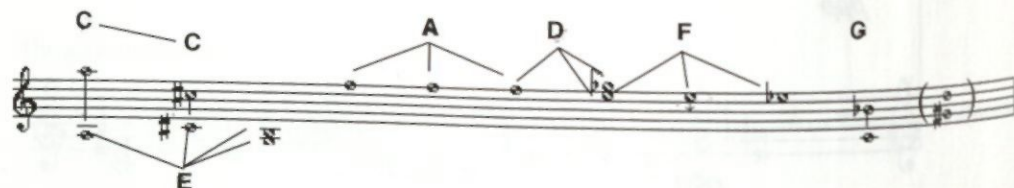
D. 3 adjacent semitones, which may include one hooter from category A but none from B or C (others may also occur)

E. 4 adjacent major seconds, which may include the two pitches of categories B or C, and either A or D (for example: B and/or D OR A and/or C OR C and/or D).

F. 3 adjacent quarter-tones, the highest or lowest of which may be a note used in either A or B or C or D or E (no other quarter-tones are to occur).

G. the remaining pitches, if any, are ad lib., providing that they do not contravene A, B, C or F. The full range of 12 chromatic semitones does not need to be used.

Sample pitch structure for 15 (17) hooters:



In the case of a car having two or more independently-operated hooters, the extra hooters may be included, provided that the total number of vehicles needed for the minimum of 15 hooters is not less than 10, and that the hooters in a single car are not in unison or one octave apart. Each performer must know how he/she is related to others by the pitch relationships specified in categories A to G. In performing the piece, emphasize these pitch relationships.

A compromise version for a conventional concert space may be performed on hooters alone, without cars; the theatrical aspect should be emphasized, perhaps using a specially-constructed stand for each hooter.

Duration free, approx. 5'-10'

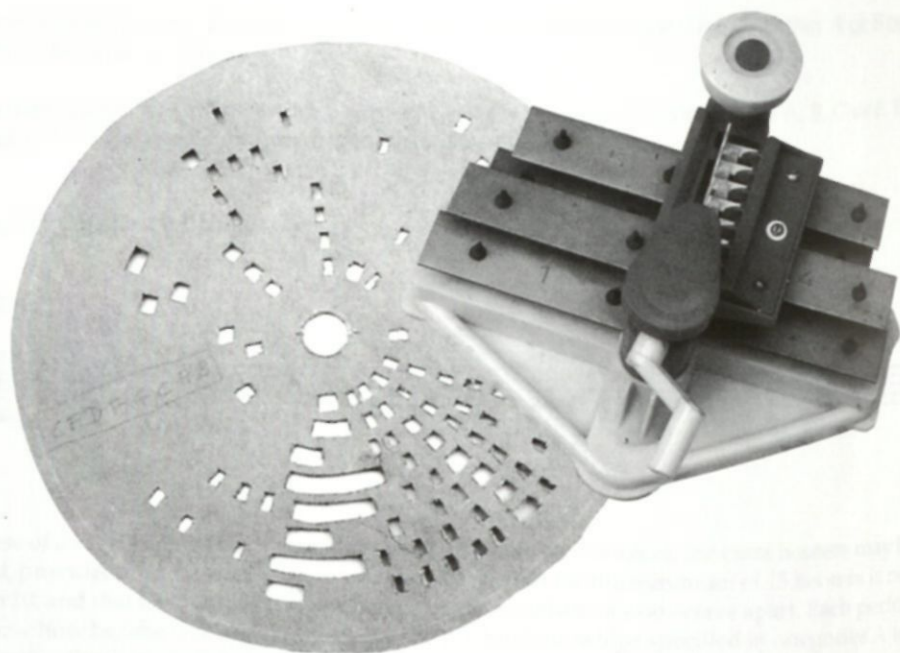
In imagining the full outdoor or showroom version I deprived myself of the possibility of presenting the work when I originally composed it; a concert version would have only required the purchase of a set of car-horns. As it was, this work has never been performed, and its score has not seen the light of day until now. More recently at least two composers have taken the trouble to assemble an ensemble of cars (one in three Car-Horn Symphonies) while others, such as György Ligeti, have followed the simpler concert option. On an even larger scale, in the last two decades a number of Harbour Symphonies have been performed.

Composition with Cadence (1969, transcribed 1977)
(on eight notes), for hand-operated toy musical box

This transcription may be performed on any keyboard instrument; a toy piano is especially suitable, due to the similarity of its sound to that of a musical box.



A recording of *Composition with Cadence* is included on the accompanying CD. The simple mechanism of this toy musical box no longer functions very well, even after I made a small modification before the recording was made.



Voice (1969)

Make a gramophone record in a public "record your own voice" booth, as found in many larger railway stations: this will result in a 45 rpm record lasting about three minutes. The recording is to be made vocally, with as much variety as possible (breathing, growling, murmuring, whistling, intoning, etc.) but excluding conventional singing. No intelligible words are to be used, though some passages may sound as if they are in a foreign language. In particular vary the speed of articulation and the use of pauses.

This recording may be played back only in an auxiliary role, as a background in performances of compositions with unspecified instrumentation or in improvisations (especially solo). Only in particular situations should it be played back complete; normally shorter sections should be selected. It may be further varied by the use of alternation between normal and reversed playback. A cheap battery-operated 45 rpm record deck is modified by installing a double pole/double throw switch, wired up so that it reverses the battery terminals (not all models may be suitable); this will enable the performer to operate the turntable in the reverse direction. When making the original recording, do not worry too much about how it might sound when played backwards.

Voice also formed the sound source in my composition *Not to be Loaded with Fish* (a "found" title from the side of a railway wagon; this also featured another early simple electrical device of my devising, a "pulsing unit" which involved rewiring the terminals inside the "wind-up" dial from a telephone so that audio sounds routed through it could be "chopped"). As we go to press I discover that Steve Beresford also made a solo recording entitled *Voice* in such a booth a couple of years later.

Wordsounds (1969)

Any number of people (preferably more than 15), if possible at least some of them non-musicians and/or children. They are divided up into three groups of approximately equal size, spatially somewhat separated. The score consists of a series of words that are written, one at a time, on a blackboard, whiteboard or large sheet of paper by the "conductor", who has no other function in the performance (but who is extremely significant in the rehearsals). The words are to be interpreted by producing sound vocally or with any object that is to hand. Visual and mimed accompaniments to the sounds are permitted, and, if desired, the performers may move around the performance space while interpreting some or all of the words in their part of the score. With words which have more than one meaning (hum, light, swallow), each individual may interpret them with either meaning (but not both).

The conductor varies the time-interval between writing each successive word, reproducing the score as given below, keeping to the three columns and the vertical sequence in which the words follow each other (e.g. PURPLE / LANDSCAPES / QUICKLY / WHEN / SIGH / NEVER / SIGN / SING / INVERT ...). Each group starts when the first word is written in its column (the conductor should ensure that all the performers can see what has just been written each time), and continues to interpret it until a new word appears in its column. To end the performance, once all the words have been written, the conductor may previously arrange to give a special hand-signal, or removes the written-down score from view, if this is possible with the facilities used, e.g. by turning the blackboard around on its easel, sliding a blank whiteboard across the one with the score, or turning over a new sheet of paper in a large block. If so desired, the performers may instead continue to improvise freely in a similar manner (possibly including words used previously) in an open-ended performance.

It is recommended that a different score should be used for rehearsals (as given below), so that the individual performers cannot plan their interpretations for any or all of their words. It is similarly preferable that the performers do not bring any special props with them to the concert.

PURPLE		LANDSCAPES		QUICKLY
WHEN				
	fairly	(SIGH	←	NEVER
	fast	(SIGN		
INVERT		(SING		
		TOMORROW		GUITAR
HUM				CENTRE
		LIGHT		
TRAVEL				TREMOLO
		POMPOUS		
SWALLOW				SIGNIFICANT
INCOHERENT		SYNCHRONISE		
		O		LIBERATE
SCRATCH				

In order to produce greater spontaneity during the performance, the following alternative version should be used for rehearsals, so that the performers do not know exactly what words to expect in the performance and will not be able to prepare artificial interpretations in advance.

QUICKLY

LANDSCAPES

PURPLE

GROW

LIGHT

ACCENTS

VIBRATION

LOW

fairly
fast (SING
(SIGN
(SIGH

SWALLOW

WHISTLE

GUITAR

FLY

INTERACTION

SYNCHRONISE

RING

WATER

French and German versions, each with a rehearsal score, are given overleaf.

An extended performance during a workshop for theatre students ended with one of them lying on the floor underneath a mound of all the chairs in the room!

Wordsounds ("Motsons"; version française, 1974)

POURPRE		PAYSAGES	
QUAND			VITE
	assez vite	(SIGNE (CYGNE (CITE	JAMAIS
RENVERSE(R)			
		DEMAIN	GUITARE
MURMURE		LÉGER	CENTRE
VOYAGE		POMPEUX	TRÉMOLO
AVALE			SIGNIFICATIF
INCOHÉRENT		SYNCHRONISE(R)	
GRATUITEMENT		O	LIBÉRER

Version pour des répétitions

VITE		PAYSAGES	
POUSSE(R)		LÉGER	POURPRE
		GRAVE	ACCENTS
VIBRATIONS	assez vite	(CITE (CYGNE (SIGNE	
SIFFLE(R)			AVALE
VOL(ER)		INTERACTION	GUITARE
SONNE(R)			SYNCHRONISE(R)
			EAU

PURPURN	LANDSCHAFTEN	SCHNELL
WENN	(SEUFZEN	NIEMALS
	ziemlich (
	schnell (ZEICHEN	
	(SINGEN	
UMKEHR(EN)	MORGEN	GITARRE
SUMMEN	LeICHT	ZENTRUM
REISE(N)	POMPÖS	TREMOLO
TAUB(E)	SYNCHRONISIEREN	BEDEUTSAM
UNVERSTÄNDLICH	O	BEFREIEN
KratZEN		

Probeversion

SCHNELL	LANDSCHAFTEN	PURPURN
WACHSEN	LeICHT	AKZENTE
SCHWINGUNG(EN)	TIEF	
	(SINGEN	
	ziemlich (ZEICHEN	
	schnell (SEUFZEN	
PFEIFE(N)		TAUB(E)
FLIEGE(N)	REAKTION	GITARRE
LÄUTEN		SYNCHRONISIEREN
		WASSER

Music for Strings (1971)

MUSIC FOR STRINGS No. 1

The performers (number ad lib.) enter together carrying solid (wood, fibreglass, etc.) violin/viola/cello/double bass cases. They slowly unpack them. Inside each case, instead of the normal instrument, is a tightly packed collection of miscellaneous rubbish - such as newspapers, magazines, crumpled musical scores, fruit and vegetables (preferably past their best, but not actually rotten), empty bottles and tin cans. Each performer leaves the stage, carrying his/her case, when he/she has completely emptied it.

MUSIC FOR STRINGS No. 2

During the first half of a concert, string instruments (violins, violas, cellos, double basses) are piled up in a reasonably ordered fashion in a large heap outside the hall; this could be indoors or - preferably - outdoors, in a place where they can be best observed from a distance, such as in the middle of an outdoor grass area near or around which the audience can walk during the interval. No performers are required, and none of the people responsible should be available to "explain" the meaning of this event. The instruments must be removed during the second half of the concert.

MUSIC FOR STRINGS No. 3 (based on an idea by Graham Hearn)

for 10 violins, 6 violas, 4 cellos, 2 double basses
1 swimming pool (full of water)

The instruments are carefully placed on the water, on their backs, so that they float, and are arranged in the traditional formation of two football teams at the start of a match, with the violins as the forwards, the violas as the halves, the cellos as the backs and the double basses as the goalkeepers. The fingerboards should point to the rear of each "player". The swimming pool should be large enough for the initial layout of the two teams of instruments to be clear to the spectators, with sufficient space between adjacent rows and particularly between the two teams. Naturally only cheap or irreparably damaged instruments should be used, but none of them should be in so bad a condition that it will sink. Leave on display for as long as appropriate.

Alternative version (suggested by Graham Hearn), for a windy day: place a lightweight rubber ball in the centre of the pool. The performance/match is over when one team scores a goal (anywhere along the ends of the pool). No human intervention is to take place.

These Fluxus-like pieces were all written during a week's course given by Gentle Fire (of which I was a member) at the Dartington Summer School in August 1971. Clearly I reacted very strongly to some of the less adventurous participants on other courses, who - as I summed it up at the time - seemed only interested in finding a second cellist for their string quintet by Boccherini.

Four Relationships of Poetry and Music (1974)

A performance project for a poet and a musician.

The poet reads specially selected or created poems, with microphone amplification, and the musician creates the specified musical relationships, playing, for example, specially constructed amplified instruments and/or (especially in "Transformation") using simple live electronic sound modification equipment:

Accompaniment - in the traditional sense

Transformation - the poet's voice is gradually transformed into "electronic" sound

Dialogue - the musical instrument is played as if it were a second human voice

Substitution - repeated key words in a specially-constructed poem are gradually replaced by the musician playing "equivalent" sounds, until the whole poem is performed in "translation" on the musical instrument.

Although I have occasionally performed with sound poets, especially in the mid-1970s in an improvisation trio and briefly as a duo with Lily Greenham, I never found the right occasion to propose working on this project.

Interlude (1974)

for 3-6 performers with musical boxes

Each performer has two small musical boxes (music boxes) or separate musical box mechanisms ("musical movements"), ideally two musical boxes or one musical box and one musical movement. In this score the term "unit" means both a musical box and a musical movement. The units (totalling between 6 and 12, depending on the number of performers) must each feature a different melody (preferably with a mixture of classical and popular tunes), and whenever possible they should be in a variety of keys and/or microtonally out of tune in relation to the majority. Some of the mechanisms of the units must be modified so that the original melodies are wholly or partly unrecognisable, either by inversion, distorted transposition or by partial "erasure".

The mechanisms can be modified in several ways, not all of which are feasible on certain models. Most of them can be carried out with very basic tools, such as a screwdriver and a small pair of pointed-nose pliers. The simplest modification consists of removing either the comb that is plucked by the pinned cylinder, or the cylinder itself, and replacing it in reverse - so that high and low pitches are inverted around the central pitch. Other possibilities include slightly displacing the comb so that the cylinder's pins pluck comb teeth that are adjacent to those that were intended by the manufacturer (distorted transposition, except when the teeth are tuned in a fully chromatic scale - which certainly never occurs on cheaper models), and breaking or cutting off some of the cylinder pins and/or the comb teeth (partial erasure); in the latter it should be noted that for some melodies several pairs of adjacent teeth are in unison, so that repeated pitches sound cleanly.

The music is an instantaneous collage that uses brief fragments of the music played on the units. Each performer selects two of the available units that are in the closest key relationship (ideally consecutive keys in the cycle of fifths), but preferably not in the same key. The performers should normally alternate between their two units, usually playing one, two or sometimes (the maximum of) three notes/chords on each unit (and, occasionally, up to five notes/chords on both units) before proceeding to the next entry. Similarly the entries should be varied, between playing either of the units (A or B), both units consecutively (AB or BA, sometimes ABA or BAB) and occasionally both simultaneously (A+B), separating them by a mixture of long/medium/short/no pauses. Each performer should find the most effective method of fixing and operating the two units in order to be able to play both of them simultaneously, one with each hand. This is straightforward with the hand-wound musical movements, but with the musical boxes it will normally be necessary to leave the lid open and release and depress with one finger the pin that is normally operated by opening or closing the lid (in some models it is also possible to place a finger in the path of the spinning fan-vanes); even so, it will not always be possible to keep to one's intention to allow a unit to sound a specific number of notes/chords.

Before a performance all the wind-up musical boxes must be fully wound and all units set at different distances from the beginning of their individual melodies; none of them should start with either of the first two notes/chords or the final one. A performance consists of the musicians creating a variety of textures, ranging from isolated pitches with pauses of different lengths, via single hocketed melodic lines, to denser polyphonic structures and chords (players may, if they wish, prepare cues for coordinating chords). Do not cover up any accidentally humorous passages that may occur.

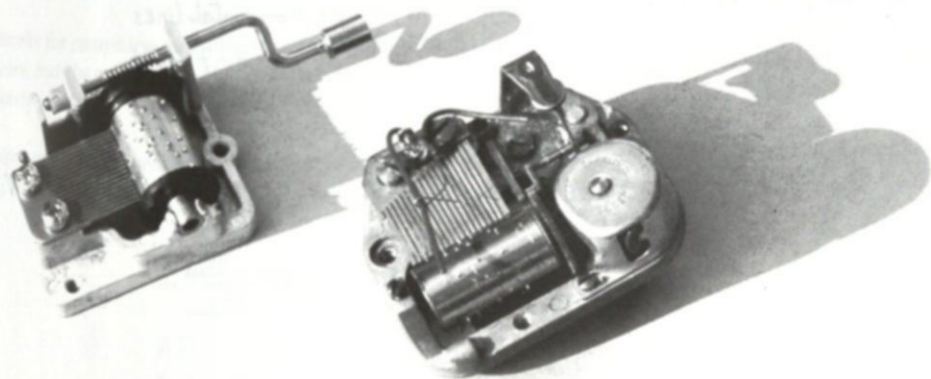
The performance should be kept fairly short (normally between 5' and 8'), as is the nature of an interlude, and ends when all the wind-up boxes have run down without rewinding; if there are any hand-wound movements, the players of these should individually stop playing them before that

time, and not later than when it becomes obvious that any wind-up musical box is slowing down. If there are only hand-wound musical movements, then a collective decision should be made in advance concerning the approximate total duration and the particular musical movement that will end the piece, and each player can then make an independent decision about the approximate time to stop playing each individual musical movement.

In most performance spaces the units (especially the separate mechanisms) will need to be amplified; this should preferably be done acoustically, ideally by screwing or bolting them to small empty solid wooden boxes, or else by placing them on hollow, resonant containers (even on a grand piano!); if this is insufficient it should be assisted by means of air or contact microphones (one per player).

Modified musical box mechanisms were probably first used by Joe Jones in constructions such as his *Flux Music Box* (1965).

A recording of *Interlude* is included on the accompanying CD; the melodies on the units were: Mendelssohn's Wedding March (inverted), Always (transposed), Beethoven's Für Elise (transposed), Twinkle Twinkle Little Star (partially erased, with four comb-teeth removed), Theme from Love Story, Greensleeves. Close miking meant that every extraneous sound is audible, whether from the musical boxes or from the domestic surroundings.



Dance

Hugh Davies

shimmering	_____
shivering	_____
slithering	_____
slipping	_____
sliding	_____
skittering	_____
stop	

score for solo dancer and/or musician

all transitions abrupt; keep to the proportions of the horizontal lines

9-7-1976

The following example was produced with an Apple II computer and Epson LX-80 printer. The first of the two illustrated printouts is the score that I typed into the computer. The printer was then set to print out double-strike and double size, which meant that the original arrangement of material within the individual lines was broken up in a way that I could not easily predict (without making precise calculations of every character and space). In printing double-strike, certain symbols are only printed on one of the runs of the printer-head, hyphens only on the first and equals signs only on the second, for example, so that successive runs of some of the lines will not be identical. The movement of the printer-head is in alternate directions, so that for odd-numbered lines it moves from left to right and for even-numbered lines from right to left; where I have created a similar pattern on successive lines, for alternate ones this will be retrograded. This regular flow of printing lines of standard length (quite a soothing sound, like the machine breathing) is occasionally extended (with underlining a complex overlapping sequence takes place) or truncated (with a substantial space at either end of a line).

A recording of the above version of **Printmusic** is included on the accompanying CD; the second of the two text file printouts is, of course, the precisely-notated score for it.

[illegible]

Projects with Children

The Musical Potential of Found Objects in New Instruments Invented by Young People (1994)

In the second half of the 20th century an increasing proportion of all kinds of music has involved instruments that did not exist at its beginning. This has gone hand in hand with the growth of improvisation, so that the repertoire problem of what music to play on them is greatly reduced. People who are musically neither trained nor self-taught are thus enabled to participate practically to a greater extent than before, which is especially beneficial for children. It is no longer necessary to be able to play a traditional instrument or to read staff notation in order to perform in a collective composition. More satisfaction still can be gained when each person has invented and built their own instrument, often using found and scrap objects to make sounds that do not directly relate to those of any conventional instrument.

Over the years, from my occasional workshops and other musical contacts with children and students, I have come to believe that every person has their ideal musical instrument. Some people discover what it is earlier or later in their lives, but many never do, especially in Western countries. As a result, such people often claim that they are completely unmusical.

I am sure that this is rarely, if ever, the case. It may generally be true within the framework of Western music, both classical and popular, given the very small proportion of the total range of musical instruments currently played across the whole planet that are employed in it - and thus are generally accepted in our culture as being the only valid ones. But, like its instruments, Western music covers only a small area of the total possibilities, and the participation of amateurs in it has been greatly reduced by the saturation of its dissemination in our technological age.

The choice, conscious or subconscious, of one's own musical instrument is a very personal one. It is often obscured for children by the limited range of instruments that can be bought fairly cheaply or borrowed at any particular time from their school or local education centre. In my own case, I have played keyboards and clarinet and sung for many years, and still enjoy doing so at home - and more rarely in public (including broadcasts and CD recordings in all three roles) in a small number of contemporary ensemble compositions where an intimate understanding of the composer's intentions is more important than professional virtuosity. But I am much happier when I am playing my own music or improvising on some of the wide range of amplified instruments that I have designed and constructed since I was in my mid-twenties in 1967, on which I have given over 160 solo concerts and lecture-recitals.

These instruments of mine, made as they are from unconventional materials and found objects, and rarely tuned to any precise scale, even a microtonal one, express most clearly my personal sound world and its links with that of taped electronic music. Instead of precise pitches and intervals (although these are still possible) there are richer, more complex sounds and noises, built-in reverberation, modulation and spatial distribution effects, sliding tones and glissandi; all of these are completely natural to my instruments - which is not the case with conventional instruments (as with woodwind multiphonics, for example).

Unless it is specifically requested, in my work with young people I rarely demonstrate my own amplified instruments or talk about the work of other musicians who are using 'low-level' electrical technology. I also discourage them from trying to build such instruments unless it is likely that they will be able to play them either at home or at school; when using contact or other special microphones with a hi-fi system, a portable mixer or other form of preamplification - such as direct monitoring through some models of tape recorder - is usually necessary. Moreover, there is already enough to do in a workshop in a limited time period without having to include an introduction to soldering techniques.

Over the period of nearly 30 years that I have been professionally active, I have worked with young people at unpredictable intervals averaging about one week per year; and in several types of workshop, largely dependent on how long I will be able to work with a particular group and what tools and facilities are available. Although I would be happy to do this rather more often, my other creative, research and teaching commitments would prevent me from doing so on any regular basis. I also enjoy the contrast in approaches

necessary for working with different age groups (from about six to twenty years old) and different backgrounds - not only with or without musical or (in the case of students) other artistic experience, but I have also occasionally had the opportunity to work with children with disabilities. Most of this work has taken place in Britain, but one major project was commissioned for the ISCM World Music Days in Bonn in 1977, and I have given demonstrations in Canada, France, Germany, Holland, Austria, Switzerland and Sweden. I give five different basic types of workshop:

- brief demonstration with audience participation of my own amplified instruments (up to 1 hour)
- demonstration with audience participation of simple acoustic instruments and noise-makers (up to 2 hours)
- short workshop in making simple instruments from bamboo (xylophones, panpipes, etc.), ending with a collective performance (at least half a day)
- longer workshop (sometimes warming up with a bamboo instrument workshop) in inventing new instruments from available or found materials, ending with a collective performance (at least 2 days)
- mixed-element workshop including some or all of the four shorter ones already listed, leading to the creation and presentation of a larger collective composition by the whole group either for live performance or on tape, with *ad lib.* additional short collective compositions/ improvisations by small groups of children who play conventional instruments (at least 3 days)

Where the time available is too short, the children are under eight years old or there are no tools, I can only demonstrate and let them try out a selection of cheap toy instruments and noise-makers, either wooden or plastic, together with simple bamboo ones that I have made for demonstration purposes during bamboo instrument workshops, and found objects, especially ones from nature. Some of the latter, like the pear and ivy leaf 'mouth clarinets' of Eastern Europe, last only as long as they are fresh.

The found objects include hazelnut shells from which squirrels, dormice or woodmice have removed one end to get at the nut inside, or have had a small hole bored in them by an insect (the same also happens with acorns); when blown across they produce simple whistles and breathy wind sounds, and conducting an ensemble of children playing these I have evoked all kinds of wind sounds up to a storm (first tried out as part of a class project on weather). More recently a friend who grew up in France told me how as a child he and his friends rubbed apricot stones against stone doorsteps to make whistles; I have tried various methods of doing this using files, including making two holes, either of which can be used for blowing and the other for controlling pitch by varying its aperture with a finger. Rhythmic clicks result from running a thumb nail slowly over the scales of a larch-cone held flat in one's hand. Simple squeakers are provided by rubbing certain fruits and vegetables, such as some varieties of apples, and reed pipes from several wild plants as well as the bulb-less Welsh onion (which, like the smaller spring onion, also produces a rather low squeak when rubbed between dry fingers).

Very simple instruments can be made almost instantly by slightly adapting found objects. Drinking straws can be cut with scissors to make simple reed pipes (with different results obtained from those made of paper and those of plastic). Balloons cut in half, with a small tube mouthpiece, can also be played as wind instruments (in addition to a variety of other methods that musicians have devised, such as stroking a blown-up balloon with wetted fingers). An effective bird call can be produced by twisting a large steel screw in a slightly larger hole in a piece of wood. Small rattles and other percussion can be made from various materials.

For bamboo workshops I always recommend to the organisers a supplier which specialises in imported bamboo products (normally from China); I try to obtain approx. 2 metre lengths of canes that are 2

centimetres in diameter. For a workshop of one day or less I estimate one metre length per child, which will be sufficient for instruments such as a five-note xylophone or panpipes. I only show three or four types of instrument in such workshops, so that the children can work in small groups on each type, helping each other where necessary. Apart from the xylophone and panpipes, the main instrument which can be made in a short time is a whirled bird "warbler", in which a guiro can also be incorporated. Two sticks are made for each xylophone and a scraper for each guiro.

The workshop begins with a brief introduction and demonstration of the instruments that are "on offer", after which the children try them out and decide which one they would like to make - although it is important to make certain that all those who choose panpipes can actually produce a sound on them! Instruments to be avoided wherever possible, because the child can do very little of the work unaided, are recorders and transverse flutes. Once everyone knows which instrument they are going to build, they are divided into appropriate groups and given the necessary tools and bamboo. Nobody is permitted to start their instrument until sufficient bamboo has been cut up for everyone's instrument.

In cutting up the bamboo a further reason for the choice of instruments becomes apparent. A bamboo cane is divided by internal membranes into a series of short hollow tubes. It can be cut to produce three types of tube: open at both ends, open at one end, and closed at both ends. Panpipes, with one end open, can be cut more or less to the right lengths for a scale by cutting on the same side of the knot (the external manifestation of the membrane) all the way along a single cane - although they can be better matched in diameter (for ease of subsequent binding) by choosing similar sections from different canes. The bird warblers consist of a tube that is closed at both ends, with a line of holes drilled along its length or expanded with a craft knife and filed into a slot. Thus cutting up several canes for panpipes and warblers leaves intermediate tubes that are open at both ends; each of these, split in half lengthwise, will become two xylophone keys (which are threaded on a long loop of string through two holes drilled at each end). Thus nothing is wasted; a rattle can even be assembled from the rings of bamboo cut off to create the different lengths for a tuned scale on panpipes or xylophone.

For instrument-building a school carpentry workshop with benches and vices is recommended, although in vacation courses one sometimes has to ask parents to lend a few basic tools and, where possible, collapsible DIY mini-workbenches (such as Black & Decker Workmates). In addition, especially when there are no proper benches, I take a home-made "bench-hook" (which enables one to hold steady the object one is sawing through by pushing it firmly against a support), and can make a couple more from scrap wood in five minutes. On principle I do not lend my own tools, since they are mostly in better condition and more expensive than those found in a school or at home!

Right from the start of a workshop I make no distinction between children who have some musical experience and those who have none; indeed the musical ones are often at a disadvantage because they think they know what music and musical instruments should be like. I try to emphasize the collaborative aspects of all the elements that contribute to the final musical performance, as opposed to the competitiveness normally encouraged in the classroom or in sports.

Most interesting for me, and much more stimulating for the children, is a workshop in which there is enough time for them to invent their own instruments. Here a well-equipped carpentry workshop is even more important, as unforeseen requirements are likely to arise. I always bring a selection of specialist basic items such as music wire and thin brass sheets for making free reeds, as well as a few special tools that I myself use to help the children at certain stages, including an electric "wood-engraver" (resembling a soldering iron) for decorating wooden surfaces, which can for example also be used to burn holes through the wall of a length of bamboo more quickly than using a hand-drill (to break the thinner membrane that internally seals off a bamboo cane at each knot I gently hammer a thick pointed wooden rod through it). Since all types of bamboo instruments have existed since prehistoric times, in a bamboo workshop I make a point of mentioning that all the tools we use - small saws, hand-drills, craft knives, files and sandpaper - are basically little different from early primitive tools, and even my wood-engraver is only a modern version of a pointed stick of hard wood

heated up in a fire.

Access to sources of scrap is essential. A visit to a nearby scrapyards can provide excellent materials, but children will often bring potential objects from their own homes. Broken bicycles and prams (especially the wheels and other moving parts), collapsible hinged wooden chairs and other furniture have proved to be fruitful. In inventing the basis for a new instrument, children with musical experience are often less imaginative. A child who plays a brass instrument will tend to insert the mouthpiece into a length of tubing, at the other end of which is a funnel fitted into a shoe-box, whereas a child who comes to the workshop unprejudiced will come up with an instrument such as one that combines both string and wind, or, an example that always comes to mind (the most original of the instruments invented during my 1977 ISCM project in Bonn), a plucked monochord with variable tuning effected by a lever.

The materials that will be needed are objects for each of the three basic elements that make up a musical instrument: a vibrating sound source, a framework in which it is mounted (which may incorporate a resonator and/or a solid block of wood or metal which functions like the amplifier in a hi-fi system), and a diffuser or radiator (like a loudspeaker); in some instruments, especially wind and percussion, one or more of these are optional or eliminated; in addition a mechanism may be added to assist the player, like the 'action' of the piano or the pipe organ. Although the sound source might seem at first consideration to be much the most important element, just as with the sound material of a composition this is not usually the case. Take for example the case of a modern instrument builder who specialises in recreating old harpsichords. In order to make an instrument that appears as authentic as possible, for lack of available commercial supplies the builder may even find it necessary to construct the keys and the lid's brass hinges - yet buys in the strings. This shows very clearly that what the builder actually does is to present the sound sources in such a way that they will sound at their best (like the exposition of the sound material in a composition), and that the notes produced are as much as possible comparable in timbre, clarity and volume over the instrument's whole range; whatever the sound sources are in actuality (created by musical instrument suppliers or found or scrap objects), provided that they have a good basic timbre and clear potential for such improvements, there is a strong likelihood that an interesting instrument will result.

Whenever time permits I end by organising some form of collective performance. I feel that this is particularly important when the children have built their own instruments, whether freshly invented (even though one can see relationships with instruments from some part of the world that are unknown to them) or based on the examples I have brought with me. The ideas for the performance are preferably contributed by the participants, but when time is short or with younger children I need to provide at least a basic framework or even a scenario. Usually this is the journey of an old fashioned steam train, since it provides sufficient elements for everyone to participate, and enables those children who do not play a traditional instrument to contribute on an equal basis. The elements of the train journey include: a quiet background in the countryside with birds singing, the engine hoots, doors are slammed, the engine hoots again and starts very slowly (possibilities for hocketing between wind and percussion), gradually gets up speed, regular "tricketty-trock" rhythms, slowing down, stopping and a final hoot.

When there is more time I solicit ideas from the group I am working with and then shape them into a suitable structure. This will include a tutti free-for-all (illustrating an agreed common experience such as a school playground or a zoo), subdivisions into different families (such as Wood and Metal, or Strings, Wind and Percussion, themselves partially subdivided into Plucked, Struck, Xylophones, etc.), solos (for the more flexible instruments) and smaller prepared groupings, 'conversations' (resulting from exercises in responding musically to each other) and so on. My own role in the performance is less as a conductor and more as a traffic policeman; by using my hands and fingers to indicate the overall and changing loudness and to designate which groups or single performers are to play or stop playing, or who is to start the next section, and by holding up cards (including the names of instrumental family divisions, of individual sections and of types of playing and articulation), I feel that I am only temporarily able to interrupt and direct the performers. Except when players imitate each other in rhythm or melodic outline, in such an ensemble it matters comparatively

little what notes any individual chooses to play at any moment - the content as opposed to the nature of the musical gestures; those who want to play melodically and tonally are counterbalanced by those who play randomly, and even by others playing in different keys. Indeed I do not set up any tonal relationships between the different instruments, and indeed where fixed pitches are essential - on wind, multiple string or keyed percussion instruments - due to lack of time I only tune them accurately rather than approximately when I am specifically asked to do so.

The elements described in the previous paragraph all came together in a very satisfactory way in a specially devised project for the ISCM World Music Days in Bonn in 1977. Twenty-eight children aged between eight and thirteen, divided into two groups, spent up to ten hours each in a workshop building instruments. First of all they each made a bamboo instrument based on models I took with me: xylophones, panpipes, bird 'warblers' combined with guiros and (a case of special pleading) a transverse flute. Once these were finished the children went on to invent their own instruments; naturally in the time available the result were very varied, ranging from basic percussion such as rattles and a set of differently sized tin cans, to simple zithers and harps and the lever-controlled plucked monochord mentioned above; a couple of them preferred to copy another of my models, a simple toy instrument of my own (a high-pitched "lion's roar" made from an empty coffee tin, which is played by rubbing with wettened fingers a taut string of nylon fishing line fastened at a small hole in the base of the tin). This was followed by nearly five hours preparing and rehearsing a collective composition with around twenty of the children, for which, failing to find a satisfactory title of our own, we adopted the organisers' **Stück für selbstzubauenden Instrumenten** ("Piece for Self-to-be-built Instruments"); only later did I come across the obscure word **Jigamaree**, which in both sound and meaning (like "thingumajig", designating "the name of something temporarily forgotten") seemed appropriate for the piece. The reviews of the performance were very favourable, describing it as "easily the most successful of the ISCM festival projects for children" (**Musical America**), while others reported on the atmosphere: "Davies drew strongly on the imagination of his group of children ... and produced a sound-work that sounded really joyful" (**Musikhandel**, Germany) and "the children enthusiastically enjoyed producing sounds on the musical instruments they had built ... as sources of sound they were all enjoyable and full of variety" (**Ongaku-geijutsu**, Japan). This resulted from my chosen role as a motivator and coordinator, enabling the children to function fairly freely within a loose framework, rather than as a composer who imposed his preconceived ideas on the children.

The most substantial source of scrap materials for any of my workshops was made available to me in 1991. This was a wide selection of scrap aluminium, supplied by British Alcan, who also sponsored the two-week summer vacation project in Liverpool during which I held a two-day workshop. The original plan was to make aluminium sound sculptures, but the scrap available lent itself more to instruments. My follow-up proposal was accepted, and I spent a day visiting three British Alcan sites, selecting a much wider range of aluminium scrap and slightly misformed castings, from thin sheets to heavy blocks and columns (we did not get everything I had asked for - it turned out that some items were manufactured for defence projects or the nuclear industry!). Already in Liverpool the sound possibilities from aluminium proved to be considerably greater than I had expected, having previously only been able to use thin sheets, plates and tubes of it. The sound sculpture project, which took place over two days with 16-18 year olds at a school in nearby Warrington, produced a substantial collaborative effort which was subsequently installed near the entrance to British Alcan's main recycling centre in the region. In both workshops the full-time presence of a specialist welder was invaluable; he also advised us as to whether the separate pieces of aluminium would have sufficient strength and rigidity, which was particularly important for the sculpture, because of its large size. The elements of the sculpture were produced by individuals and groups of up to four people; halfway through we took stock of what was being constructed and drew up a tree-like design that would incorporate all of them and have an overall visual coherence.

FURTHER READING

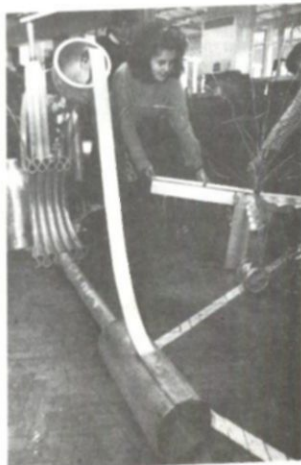
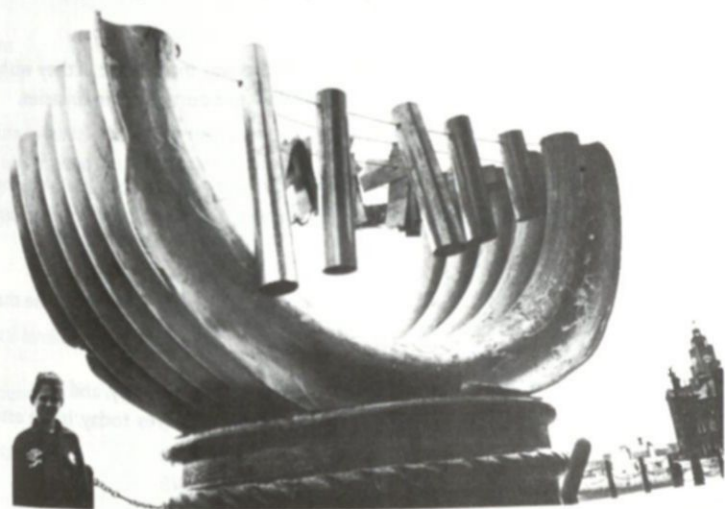
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The Aims of My Musical Projects for Children (1977/1993)

Right from the beginning my courses for children have been given in the role of an instrument maker rather than as a composer. Up to now it was only in my very first course (1969) and now in Bonn (1977) that I have been able to work for so long a period of time with the same group of children, so that it was at all possible to think about the musical potentials of the instruments they have built. I have subsequently made a point of ending with a simple collective performance whenever possible.

In devising such a musical performance I do not try to present myself in the normal way as a composer who determines everything for his "servants", but much more as an assistant to the children; in an ideal situation with sufficient time, I would let them make all the compositional decisions. In many areas of the contemporary arts the artist actually only provides the initial stimulus: "this and that are possible". Then it is open to anyone whose eyes and ears are somewhat open for this, to take over these ideas and develop them further in **his/her own way**. This is how I regard myself.

With such a project my aims are:

- for musically trained children to experience musical possibilities beyond practising and playing traditional Western music on traditional instruments
- for children who are **not** musically trained nonetheless to find a way into music, if they wish, whether with traditional instruments or in another way; and to encourage their fantasies, unfettered as they are by "knowing how music should be"
- for all the children, whether musical or not, to have the opportunity to collaborate in playing music together, with the particular pride that comes from each of them performing on a self-invented or self-built instrument
- for all children, especially in countries where the standard of living is fairly high, to realise that the riches of our planet do not need to be consumed and thrown away so quickly
- finally for the children to learn to work with each other peacefully and willingly, and to understand that the normal competitiveness, so much preferred in our lives today, is not essential; and for them to enjoy themselves.

Compiled in 1993 from several short texts written in 1977 in connection with my children's piece Jigamaree.

Jigamaree (1977)

Jigamaree is a collective composition by the composer and a group of about fifteen children aged between eight and thirteen, and played by them on instruments they had built during a week of workshops. This was the result of a project specially devised for the ISCM World Music Days in Bonn, and premiered at the Bonn Center on May 15th 1977 under Hugh Davies' direction as part of a concert of music for children.

The approximately twenty children who participated in the rehearsals for **Jigamaree** had an average of two instruments each:

- 8 bamboo bird warblers/guiros
- 6 bamboo xylophones
- 4 bamboo panpipes
- 2 bamboo trumpets
- 1 bamboo recorder
- 1 bamboo slide whistle
- 8 plucked string instruments
- 4 bowed/rubbed string instruments
- 2 bells
- 4 tin-can drums
- 3 bamboo rattles

At the last minute I was too busy sorting out the reallocation of the missing players' roles to note down which of the children and their instruments were absent.

The elements of the form plan of **Jigamaree** and timings for a 10 minute performance (slightly reduced in Bonn) were:

bird warblers	0'00"
mix/instrumental families	0'30"
group B	2'15"
"school playground"	3'30"
group A	4'15"
mix/instrumental families	6'15"
"discussion"	8'00"
END	10'00"

In my role as the performance director - like a traffic policeman - I used not only arm and finger gestures but also held up large prepared cards on which I had written the above names (in the two "mix" sections I combined different instrumental families, each with its own card).

None of us came up with a suitable title for this piece: later on I found the obscure word "jigamaree", which (like "thingumajig") appropriately means the name of something temporarily forgotten.

On several subsequent occasions I have further developed the ideas of **Jigamaree** in ensemble pieces played by children (also in a piece for the London Improvisers Orchestra, for a concert in 2001). The prepared cards have been replaced by hand gestures, a "claw-shape" denoting a group of players with a single type of instrument.

A recording of **Jigamaree** is included on the accompanying CD.

Bamboo Musical Instrument Workshops

This project was originally designed for holiday, half-term or weekend groups of children; it needs a minimum of one whole day. For an equivalent project in a primary school, with a maximum half-day working time of 2 hours, building the instruments requires three half days. This involves all the tools and facilities listed below as well as an appropriate number of extra adult helpers (parents, etc.). The fourth (possibly also a fifth) half day will concentrate on playing the instruments and making music together; no extra helpers or facilities needed.

I wish to acknowledge here that my first bamboo instrument workshops were given in the mid-1970s jointly with the instrument-inventor Max Eastley, a close colleague for many years; neither knows which of us originated the various elements that form the basis of the bamboo workshops that I have subsequently given on my own.

The bamboo normally comes from China; in Britain I can recommend to the organisers a special importer which specialises in bamboo and bamboo products. I try to obtain approx. 2 metre lengths of at least 2 centimetres diameter. I estimate one metre length per child, which will be sufficient for simple versions of the more elaborate instruments, such as five-note xylophones and panpipes. In such workshops I only demonstrate three or four types of instrument, so that small groups of children can work together on each type, helping each other. Apart from xylophone and panpipes, the main instrument which can be made in a short time is a whirled bird "warbler", to which a scraper (guiro) is also added.

At the beginning of the workshop, after a brief spoken introduction and demonstration of the instruments that are "on offer", the children try them out and decide which one they would like to make - although it is important to make certain that all those who choose panpipes can actually make a sound on them! Instruments to be avoided wherever possible, because the child can do very little of the work unaided, are bamboo recorders and transverse flutes. Once everyone knows which instrument they will build, they are divided into appropriate groups and given the necessary tools and sufficient bamboo. Nobody is permitted to start their instrument until sufficient bamboo has been cut up for everyone.

In cutting up the bamboo a further reason for the choice of different instruments becomes apparent. Bamboo consists of a series of short hollow tubes that are separated by internal membranes. These can be cut to produce three types of tube: closed at both ends, open at one end, and open at both ends. Panpipes, with one end open, can be cut more or less to the right lengths for a scale by cutting on the same side of each knot (the outside manifestation of the internal membrane) all the way along a single length - although they can often be better matched in diameter (for ease of subsequent binding) by choosing similar sections from different tubes. The bird warblers consist of a tube that is closed at both ends, with a line of holes drilled along its length and expanded into a slot with a craft knife and files. Thus a series of such instruments cut from a length of bamboo will leave intermediate tubes that are open at both ends, which, split in half lengthwise, become xylophone keys (threaded on a length of string through two holes drilled at each end); two people share each split xylophone tube. Thus nothing is wasted; a rattle can even be assembled on a string from the cut-off rings of bamboo (e.g. for tuning purposes).

*This text is my "publicity sheet", and is largely based on the article **The Musical Potential of Found Objects in New Instruments Invented by Young People**.*

*All three types of bamboo instrument are included in the recording of **Jigamaree** on the accompanying CD.*

BAMBOO MUSICAL INSTRUMENTS FOR CHILDREN

Tools and materials required for a workshop

Minimum duration: 6 hours

for children aged between 8 and 14; adult helpers will be needed for groups larger than 10, approx. 1 adult for 5 extra children; no experience in carpentry or music is necessary for adults or children

TOOLS (minimum quantities for 20 participants)

2 craft knives (Stanley, etc.); with spare blades:



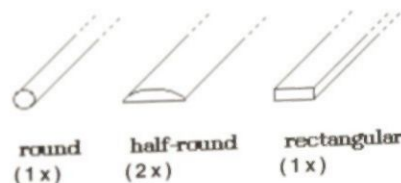
5 junior hacksaws:



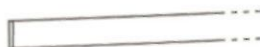
2 tenon saws (or other small saws with fine teeth):



4 medium-sized files:



2 medium-sized screwdrivers (flat-bladed ["slot"] not Philips):



3 hand-drills (each with 2 bits ca. 3-4mm and 1 bit ca. 6-8mm)

2 steel or wooden rulers (30cm), with pencils

several pairs of classroom scissors

WORKING SURFACES

Ideally a school carpentry workshop with benches and vices, otherwise:

2-3 large work tables ("trestle" or similar) and at least 2 Workmates (portable work benches)

MATERIALS

20 metres thicker bamboo, minimum external diameter 2cm; preferably in 2 metre lengths

3 bamboo canes, ca. 150 x 1.5 cm; from a gardening shop

10 small garden sticks, ca. 50 x 0.5 cm; preferably not bamboo

20 wooden balls (ca. 1.2 - 2.0 cm diameter), preferably of different sizes

1 packet of sandpaper (fine and medium), or 5 different sheets

2 large balls of strong, smooth parcel string, ca. 1.5 mm

Other Texts

Multiple Reflections on Echoes (1977)

Mountain Echoes. High-pitched sounds are chosen for clarity in conveying information; one gets enough echoes to verify the transmission of one's voice (and to give one a feeling of power), but not too many to confuse the result: as in whistle languages (which have been proved capable of conveying information precisely over distances that shouting would not achieve) and yodelling (presumably most effective when only some of the notes are in a higher register). I do not know if the eastern Mongolians (whose *xō-mi* high overtone singing resembles these in pitch range, fairly rapid speed and use of larger pitch intervals) also have such appropriately-spaced mountains around them; from what I can gather from record sleeve notes, such singing is often done while riding on horseback, so that their high vocal register may have been caused by the desire to hear themselves clearly and thus in a pitch-range that is distinct from the sounds of galloping hooves. For simpler signalling over even longer distances much lower sounds seem preferable, as produced by the Swiss alpenhorn and the Tibetan *dung-chen* (long trumpet).

Have the increasing loudness and numbers of ships' engines at sea forced whales to refine and adapt their songs, since the long-distance echoes of their singing are no longer as clear as they must have been even thirty years ago? [Did the invention of door-catches increase the intelligence and vocal abilities of cats and dogs, in forcing them to find ways to persuade humans to stop what they are doing in order to open doors for their pets? It is noticeable that human and presumably animal babies rapidly learn to cry in a way that uses the prevailing room acoustics to their most devastating effect, so that their mothers cannot ignore this for very long.]

In Western composed music, echoes have been imitated in various ways. Two well-known examples from the past are the duet "Audi Coelum" in Monteverdi's *Vespers* of 1610, and the echo chorus "In Our Deep Vaulted Cell" in Purcell's opera *Dido and Aeneas* from c. 1689. It is only during the last ten years that musicians have started to make creative use of actual echoes. Alvin Lucier has done the most work in this area, principally in *Vespers* (room echoes reflecting pulse trains; 1968), but also using related aspects in *Whistlers* (based on ionospheric sounds, 1967), *I am Sitting in a Room* (multiple re-recordings in the same room acoustic, 1970) and *Vifarb/Hyperb* (making use of standing waves, 1973). In a similar vein is Stuart Marshall's *Heterophonics*. One part of Stockhausen's *Alphabet* (1973) instructs a performer to explore echo reflections in a manner that is similar to that of Lucier's *Vespers*. Less direct applications of echoes occur in the considerable number of works that use acoustic feedback, tape or electronic delay systems, and certain rhythmic and systemic percussion pieces (where they may not always be welcome), as in Steve Reich's *Clapping Music* of 1972 and *Music for Pieces of Wood* of 1973. Finally mention should be made of John Chowning's computer programme for simulating sound spaces. All these pieces use sound sources with similar features to those mentioned under Mountain Echoes: high pitch ranges, larger melodic pitch intervals at fairly rapid speeds with silences between successive sounds when they are more percussive, or slowly changing complex sustained sounds.

In improvised music, Evan Parker is the only performer that I have heard who uses echo reflections to create difference tones with himself (on soprano sax), once again high up and very fast. I must confess my delight in hearing him do this during a solo at the Purcell Room in May 1976, since I had included a very short passage requiring a single player to do the very same thing in *Differentials*, a trio for wind instruments, which I finished a few months before.

I have also indicated the use of echoes in my environmental listening scores *Sounds Heard at La Sainte-Baume* of 1974, striking stones together in a rocky valley in a manner similar to that in Lucier's *Vespers*, and a subsequent adaptation of this indicates that one should run one's thumbnails independently and at slightly different speeds over the surface of two larchcones held in one's hands in an echoing open-air environment, producing a sound like a clockwork machine. Finally, I hope soon to be able to realise a project that I conceived in 1968, in which sonar-like devices (as adapted for blind people) map out a space in terms of direction, distance and absorptivity of the people and objects in it.

The increased use of concrete and brick for entire buildings, their larger sizes, their greater proximity to each other and the fewer absorptive materials (such as plants, bushes and trees) in between them, create more echoes in modern life

that can be primarily disturbing, and most people may well be unaware of the contribution made by echoes to the disruptive sounds they make. An adventure playground separates the back garden of the four-storey house in which I live from the gardens of other similarly tall houses. Sounds of children hammering, and until recently of dogs barking in a neighbour's garden, are reflected back to our house with a delay of approximately $\frac{1}{4}$ - $\frac{1}{2}$ second, which roughly doubles the audible length of such sharply percussive sounds, and the distance is short enough (50-100 metres each way) for the loudness not to be greatly diminished. It is probably fairly close to the most suitable distance to produce the maximum annoyance! Similar distances are found on many new university and college campuses, school buildings, housing estates, etc.

Not forgetting lighter music, various types of echoes are used to great effect and amusement on older recording by Morecambe and Wise of "Me and My Shadow", including a man-sized echo chamber and singing in close canon at the unison (one sings everything half a beat after the other).

A science fiction novel features echoes. Daniel Galouye's **Dark Universe** describes a future civilization living in a huge underground series of caves without any form of light, after an atomic war. Echo-location using click-stones has been developed to a high degree, so that it is possible to identify known individuals immediately by sound alone.

Musics 15 (1977) included, under this overall title, a substantial collection of contributions on the theme of echoes, written by Michael Parsons, David Toop, Charles K. Noyes, David Cunningham and me. Since I was the one who devised the original title, I feel justified in borrowing it for my own text. My sonar project was one of two that I had proposed for a short project at the STEIM studio in Amsterdam; in the end I worked on the other one, researching into building my own contact microphones.

Bureaucracy (Winter 1966-67)

Imagine that, for some unexplained reason, an adult elephant is lying down on a pile of important papers which you urgently need. Clearly there is a good reason for the elephant being there, and it knows it. You must find a way to persuade it to change its mind and move away.

Germany. Run around shouting at the elephant, hitting it with a stick, and when these have no effect, start shooting a rifle into the air. Eventually the elephant gives up and hurries off.

Britain. Talk to the elephant nicely ("Come on, old chap"), and try to entice it away. After a while it decides it would like to make friends (but on its own terms), and walks over to you.

France. Offer the elephant a bunch of bananas, holding them at a distance so that it can only reach them by standing up; which of course it does, immediately.

Moral: the more imaginative a method you can devise for circumventing the rules, the more successful you will be.

Punctuality (Winter 1966-67)

Two people, whom we will call A and B, arrange to meet at a specified place at a precise time, let us say 11 a.m. A arrives first.

Germany, 11.01 a.m. B arrives. A looks at his/her watch: "I thought we said 11 o'clock".

Britain, 11.15 a.m. B has not yet arrived. A thinks: "Did we say **eleven** o'clock?".

France, 11.30 a.m. B has not yet arrived. A thinks: "It's about time that B turned up".

*Between December 1966 and March 1967 I worked in Paris, immediately following two years in Germany. As an Englishman this gave me an ideal opportunity to compare the way in which these three nations deal with aspects of everyday life, based on my own experiences. In 1975 I wrote up these two short texts from memory; the original text of **Bureaucracy** has been lost, so I have reconstructed it for this book.*

Analogue versus Digital (1989)

As far as we understand such things at present, only two species on planet Earth show a high degree of intelligence, as opposed to ability in a single type of activity. The major achievements of some members of the cetacean family, such as whales and porpoises, seem to lie in the fields of philosophy, what we would anthropomorphically call "humanism" and altruism ("Love one another" and "Love thy neighbour"), as well as in vocal music and (three-dimensional) dance and drama. Some members of the human race have also explored these areas, but with comparatively less success, and as a race we have instead specialised in the skills of engineering and craftsmanship, as well as of their applications in painting, sculpture, instrumental music and literature.

This is not intended to denigrate the wonderful achievements, in our own terms, of humans and especially of human artists in the fields in which cetaceans excel. In the future, for example, a small number of humans may be able to match, in low or zero gravity (away from Earth) the grace and beauty of movement in three dimensions that every cetacean apparently acquires before reaching maturity - but, until then, in this writer's opinion, no human dance is as breathtakingly moving as a humpback whale soaring through the air and returning to the sea, with its powerful tail fin the last part of it to disappear from view.

Why have these two species evolved in such different ways? It cannot just be the different media - of water and air respectively - in which they move. The principal reason appears to have been the development by the monkey family of hands capable of grasping and climbing, and especially of the flexible appendages that we call fingers or digits.

Understanding as we do the capabilities of separately-manipulable digits, the human race is uniquely positioned to understand both analogue and digital methods of control, and to have developed technology that exploits both of these - until the mid-1870s all forms of information storage, communication and retrieval were digital, then the telephone and phonograph/gramophone initiated an analogue century, and we are now two decades into a second digital era (which may possibly turn out to be a hybrid analogue-digital one).

Only a digitally-gifted species could have devised the musical keyboard and equivalent control systems that are found in many areas of our everyday life.

May 1968 (1993)

In 1968 the contemporary music scene was much smaller than today. Everyone knew everyone else. Moving to London in summer 1967, I quickly became involved in a variety of activities - such as founding at Goldsmiths' College the first electronic music studio in higher education and organising concerts at the Arts Laboratory in Drury Lane. Such optimism, dampened by the Russian invasion of Czechoslovakia in August 1968, lasted until the first problems over oil in 1973.

1968 was the year when I started out in the several creative areas in which I still work; different approaches were featured in three new compositions presented in March that year. But most important was the premiere in July of my first fully-fledged invented amplified instrument **Shozyg I** (built in May or June).

*Written in response to an editorial request to contribute to a 25th anniversary symposium in **The Wire**.*

Four Aspects of Knowledge in Creative Work (EX-PER)

Hugh Davies (1976)

EXPERIENCE	Knowledge of how to set about exploring and exploiting one's chosen materials.
EXPERTNESS (EXPERTISE)	Efficient methods of access to required knowledge, as opposed to storing everything in one's head.
EXPERIMENTATION	Accumulating knowledge about something new as a result of research techniques and scientific enquiry.
EXPERIENTIAL (APPROACH)	Investigation of unfamiliar subjects and disciplines as potential sources of new knowledge, instead of comfortably remaining with familiar ones.

Artists base their work on their
personal and creative experiences.

They experiment with forms and
materials, establishing styles in
which they become expert. The art
work offers a new communication
for those who experience it.

The Four Aspects were formulated in response to a request for a definition; the statement was added some fifteen years later.

Competition Juries (2002)

With many competition juries there is a tendency for the winner not to be the first choice of most, if any, of the jury members. Some composers excel at winning competitions, but their compositions usually do not turn out to be major works. Why is this?

Individual jury members often select as their first choice a work with some unusual features, which will not appeal strongly to most of their colleagues; in a final vote, it is the second, third or even lower choice of the majority that will win. The larger the jury, the more likely this is to occur; with only three jury members, there is the possibility for detailed discussions about the more unusual pieces, and one juror might be convinced by the comments of another.

Such conclusions are clearly applicable in various other contexts, not necessarily only artistic ones.

TWO HAIKU

Haiku (1974)

Raindrops
muted by dead leaves
outside my window.

The early sun, escaping from a cloud
paints the boughs
silver.

Aware that it contains significantly more than the 17 syllables that constitute a true haiku (but feeling that it could have been a translation from a Japanese original), I wrote this text one bright autumn morning after it had rained, and promptly set it to music as a very short song for voice and piano.

Haiku for Charlie Morrow (1981)

Inter-City train.
Look: silent discussion.
It's soundproof!

Deaf and dumb.

Sitting at one end of a carriage-long compartment before my first journey on one of British Rail's newly-introduced Inter-City 125 express trains, I observed but could not hear an animated conversation of a group of people at the other end of the compartment, and said to myself (with considerable surprise, followed by disillusionment) "they've actually thought about soundproofing!"

The original haiku was sent on a postcard of the new locomotive to the American composer Charlie Morrow, who had recently visited me in London - probably because we had discussed British trains and train journeys.

With many competitors in the series, the results were very close. The first round was held in the morning, and the second round was held in the afternoon. The results of the first round were as follows:

Individual and team results of the first round were as follows: Individual: 1st - John Smith, 2nd - John Doe, 3rd - John Brown. Team: 1st - Team A, 2nd - Team B, 3rd - Team C. The results of the second round were as follows:

Individual and team results of the second round were as follows:

Individual and team results of the third round were as follows: Individual: 1st - John Smith, 2nd - John Doe, 3rd - John Brown. Team: 1st - Team A, 2nd - Team B, 3rd - Team C. The results of the fourth round were as follows:

Individual and team results of the fifth round were as follows: Individual: 1st - John Smith, 2nd - John Doe, 3rd - John Brown. Team: 1st - Team A, 2nd - Team B, 3rd - Team C. The results of the sixth round were as follows:

Individual and team results of the seventh round were as follows: Individual: 1st - John Smith, 2nd - John Doe, 3rd - John Brown. Team: 1st - Team A, 2nd - Team B, 3rd - Team C. The results of the eighth round were as follows:

Notes on Other Works Included on the CD

Taken for a Ride! (1967); monophonic tape

This early work, a taped collage based on existing music, would now be called "plunderphonic" (a genre established in the 1980s by the Canadian composer John Oswald), and currently a major - often legal - issue as a result of recent developments in sampling. In the 1960s several approaches to the modification of existing music were adopted, from substantial processing, including layering and intermodulation, in Stockhausen's **Telemusik** and **Hymnen**, to cut-ups of a single piece of music, as in the Elvis Presley song used in James Tenney's **Collage No. 1 (Blue Suede)**. Closer to my own simpler approach is a work that I only heard after it was released on CD in 1998, Philip Corner's "sound assemblage" **From Thais**; both works were created at home using a single tape recorder, in my case a portable machine that was both monophonic and single-speed. I overcame the latter limitation by manually slowing down the tape spools. All the music and other sounds were recorded directly from the radio, the shorter inserts mostly being spliced into the final tape. The title comes from the first of the two familiar pieces of 19th century music that turned out to be linked by a similar rhythmic and melodic shape, Wagner's **Ride of the Valkyries** and Rimsky-Korsakov's **Sheherazade**.

*A recording of **Taken for a Ride!** is included on the accompanying CD.*

Organic Rhythms (1981)

improvised performance on the sound installation **Macro-Process Organ**

The **Macro-Process Organ** is normally installed in an exhibition space; because it takes between one and two days to set up, I only perform **Organic Rhythms** when I participate in a concert in the same space. A keyboard-like panel, on which 21 push-buttons are mounted, controls 19 electric motors and 2 buzzers that are variously mounted around the walls, ceiling and floor. The motors create sounds from a range of household and found objects, including a flat board into which an array of nails has been hammered to different lengths, a camera strap that taps against the wall as it rotates, a small suspended bell that occasionally strikes either or both of two suspended aluminium "tubular bells", rotating wooden balls that strike resonant found objects (such as an egg slicer, a plastic container, the silver lid from a butter dish and the inside of an empty soft drinks can), and a toothbrush that revolves horizontally beneath a horizontal LP record.

To encourage the public to explore the "organ", there is no positional relationship between each sound source and the keyboard switch that controls it. Since these are different in each exhibition space, I prepare a sheet of paper for me to identify them during the performance.

Extracts from exhibition reviews:

- "there is a splendid organ on which a symphony of sounds can be created by pressing keys attached to likely objects like egg slicers."
- "... the macro-process organ is a fantastical instrument... the room comes alive with a multitude of tiny noises that ring and buzz in the air around you."
- "... Hugh Davies's "space organ" seemed to offer equally convincing discoveries of untried paths on the border of sound and image..."

A comment written by a child in a visitor's book:

"I thought that the ogone [organ] was the best when you saw the things were going around."

A recording of **Organic Rhythms** is included on the accompanying CD.

Embellishments (1994 rev. 1997, 2001)

The title incorporates the word "bell", the principal sound used in the instrument on which **Embellishments** is played, the composer's sound installation **Ring dem Bells** (1991, expanded 1997). On two modified telephones each of the large push-buttons operates either a two-note "ding-dong" door chime or a buzzer, which have in turn been modified, either in pitch or in timbre, or both (see note below). This work can be performed by either one or two performers.

For a solo the performer sits facing the audience at a small table, on which the two telephone consoles are placed side by side.

For a duo the two performers sit at the two lateral sides of the table, facing each other, with one telephone console each.

All the chimes and buzzers (apart from the two optional double-ball chimes), plus the two distribution boxes, are placed on a second table behind the first, which must be as large as or larger than the performance table. They are arranged across the table's surface as if in the display window of a shop.

An unusual musical feature of **Ring dem Bells** is that each push-button controls two pitches, the first when the button is depressed and the second only when the button is released. So the second pitch can be delayed, even for quite a long time.

In a duo, two additional switches are ideally be placed at the centre of the table, within reach of both performers; these control two door chimes (each modified with two wooden-ball vibrato additions) which are placed at the front of the table, on the audience's side. A suggested plan for a duo performance of **Embellishments** (especially if it follows a solo performance version) is as follows:

The second (guest) performer begins alone; after 2-3 minutes the first performer gradually begins to join in, building up to a duo, but without using the two buzzers (* and #) on each telephone; at an appropriate point each performer begins to include one of the two additional chimes; next they concentrate only on the latter; one performer then takes over the second switch, stands up and moves to the long side of the table (soloist's position), enabling the other performer to move to the vacant chair; the standing performer then sits in the other chair; and a short duo ensues using only the four buzzers, followed by the reintroduction of the chimes and a full-scale duo to the end of the performance.

Ring dem Bells (1991/1997)

Ring dem Bells consists of eighteen two-note ("ding-dong") door chimes of various manufacturers and models, four small electrical buzzers and two push-button telephones, all of which have been modified internally; the telephones now function as a type of musical keyboard. It was originally built for an exhibition on the theme of shopping - I was surprised to find that so many different models of door chime were available in our affluent Western culture, especially as few people will purchase more than one door chime in their whole life (if any at all).

When I decided on the title **Ring dem Bells** (in grammatical English it would be **Ring the Bells**, which is much weaker!), partly because telephones are normally used to "ring" another person, it seemed to have a "jive" connection. Later on I discovered that an early foxtrot (1930) by Duke Ellington has this title, though I am not aware of having heard of it before 1996.

*A recording of **Embellishments** is included on the accompanying CD.*

Journal of the History of the Earth and Planetary Sciences

The American Mineralogical Society

Annals of the New York Academy of Sciences

Geological Society of America

Academy of Natural Sciences

U.S. Geological Survey

Geological Society of London

Journal of the Royal Microscopical Society

Journal of the Royal Society of Medicine

Journal of the Royal Society of Edinburgh

Journal of the Royal Society of London

Journal of the Royal Society of Medicine

Journal of the Royal Society of Edinburgh

Journal of the Royal Society of London

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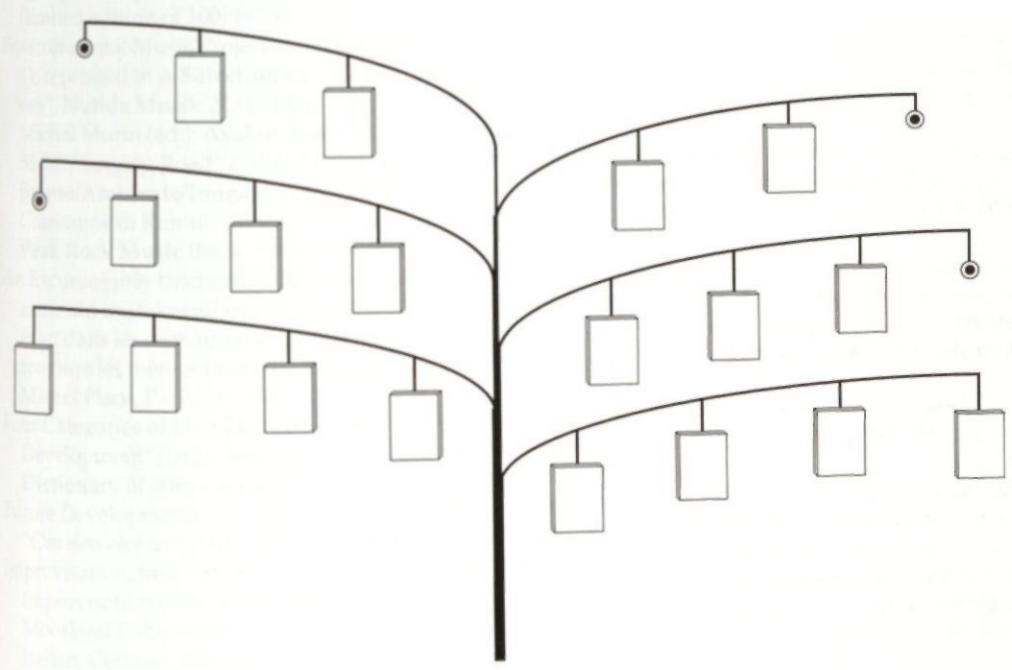
Journal of the Royal Society of Edinburgh

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Journal of the Royal Society of Medicine

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Journal of the Royal Society of London



Through its analysis of the world, the book shows that the world is not a single entity, but a collection of many different entities, each with its own history and its own future. The book is a masterpiece of scholarship and a masterpiece of art.

For a book of this kind, it is a masterpiece of scholarship and a masterpiece of art.

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At the time of writing, the book was a masterpiece of scholarship and a masterpiece of art. It was a masterpiece of scholarship and a masterpiece of art.

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Publication History

Around half of the contents of this book has been previously published, sometimes only partially or in earlier versions.

- The Aims of My Musical Projects for Children. **Musicworks** 57 (Winter 1994), 16.
- Audio Art - próba definicji [Audio Art: Notes Towards a Definition]. **Festival Audio Art** [festival programme folder; in Polish translation], Cracow, 1993; revised reprints in **3. Internationale Akademie für Neue Komposition 1995** [festival programme book; in English], Schwaz (Austria), 1995, 14; **Avant** 19 (Summer 2001), 44; online at tirol.php.highway.telekom.at/avantgarde.schwaz/deutsch/essays_davies.html
- Eargong [score-poster with instrument; in English and in French translation]. **Collection OUt** No. 4 (limited edition of 100; 1975).
- Environmental Music Projects [environmental music documentation]. **Musics** 20 (December 1978), 11; reprinted in **A Selection of "Sounds Heard"** [q.v.]; Swedish translation in "Musiken omkring oss", **Nutida Musik** 22/1 (1978-79), 50-51; Slovakian translation in "Výber z "Počutých zvukov"" Michal Murin (ed.): **Avalanches 1990-95**, Spoločnosť pre nekonvenčnú hudbu, Bratislava, 1995, 51-52. "Singing Road" / "Strada che canta" in **Sonorità Prospettiche/Perspective Sonorities; Suono/Ambiente/Immagine** [exhibition catalogue; in English and in Italian translation], Commune di Rimini, Rimini, 1982, 41; "Acoustic Park" reprinted in Daniel Goode (ed.): **The Frog Peak Rock Music Book**, Frog Peak Music, Lebanon, NH, 1995, 19.
- An Excursus into Uncharted Domains of Comparative Musicology, or How to avoid making the same old mistakes all over again. **Musics** 3 (August-September 1975), 6-9; French translation: "Un écart dans les domaines inexplorés de la musicologie comparative, ou comment éviter de refaire toujours les mêmes erreurs bien connues?". Henri Chopin: **Poésie sonore internationale**. Jean-Michel Place, Paris, 1979, 46-48.
- Four Categories of Live Electronic Music [revised from part of "Electronic Music: History and Development"]. John Vinton (ed.): **Dictionary of Contemporary Music**, Dutton, New York / **Dictionary of 20th Century Music**, Thames & Hudson, London, 1974, 215.
- Future Developments in Electronic Music. **Microphone** 1 (February 1972), 2-3; Swedish translation: "Om den elektroniska musikens framtida utveckling". **Nutida Musik** 15/2 (1971-72), 13-14.
- Improvisation, Indeterminacy and Intuitive Music [originally untitled section on the Music Improvisation Company]. Derek Bailey: **Improvisation: Its Nature and Practice in Music**. Moorland Publishing, Ashbourne, 1980, 112-113 / Prentice-Hall, Englewood Cliffs, NJ, 1983 [also Italian, German, French, Dutch and Japanese translations]; 2nd. edition: British Library, London, 1992/Da Capo, New York, 1993, 95.
- Jigamaree. **Musicworks** 57 (Winter 1994), 16.
- May 1968 [symposium contribution]. **The Wire** 111 (May 1993), 32.
- The Musical Potential of Found Objects in New Instruments Invented by Young People. **Musicworks** 57 (Winter 1994), 14-20; partially reprinted in Slovakian translation in **Večery Novej Hudby (5): Medzinárodný Festival** [festival programme book], Bratislava, 1994, 79-81.
- Multiple Reflections on Echoes [symposium contribution]. **Musics** 15 (December 1977), 10.
- Musical Environments [revised from forum contribution]. **Composer-to-Composer 1990** [audio cassette; Panel 3, Tape 1], Telluride Institute, Telluride, CO, 1990.
- My Artistic Make-Up. **Making Music: New and Unusual Instruments** [touring exhibition catalogue], Craftspace, Midland Arts Centre, Birmingham, 1989.
- My Environmental Music [originally untitled]. **Evenings of New Music (5): International Festival / Večery Novej Hudby (5): Medzinárodný Festival** [separate festival programme books; in English and in Slovakian translation], Bratislava, 1994, 79-80 / 81-83.
- New Musical Instruments. **Making Music: New and Unusual Instruments** [touring exhibition

- catalogue], Craftspace, Midland Arts Centre, Birmingham, 1989 [only half of this text was printed].
- A Parable: Gondwanaland. John Latham: **Report of a Surveyor**. Edition Hansjörg Mayer, Stuttgart & London/Tate Gallery Publications, London, 1984, 41-42.
- Ring dem Bells. **Resonancias** [exhibition catalogue; in English and in Spanish translation], Museo Municipal, Málaga, 2000, 44, 92-93.
- The Role of the Artist [revised from part of my response to a questionnaire in the symposium "Art and Social Purpose"]. **Studio International** (March-April 1976), 168-69.
- A Selection of "Sounds Heard" [environmental music documentation and projects, incl. **Sounds Heard at la Sainte-Baume, Environmental Music Projects** and, in different combinations, six other texts and scores reprinted in this book; own publication]. London, 1978 [8 pp] (revised reprints 1988, 1994); mostly reprinted in **Ear Magazine** 16/2 (May 1991), 40-45; in Swedish translation: "Musiken omkring oss", **Nutida Musik** 22/1 (1978-79), 46-51; selections reprinted in Daniel Goode (ed.): **The Frog Peak Rock Music Book**, Frog Peak Music, Lebanon, NH, 1995, 18; in Slovakian translation: "Výber z 'Počutých zvukov'", Michal Murin (ed.): **Avalanches 1990-95**, Spoločnosť pre nekonvenčnú hudbu, Bratislava, 1995, 50-52; "Mouth in Wind" quoted in David Roberts: "Hugh Davies - Instrument Maker". **Contact** 17 (Summer 1977), 12, revised as "The A-Z of Hugh Davies". **Crafts** 37 (March-April 1979) 35.
- Sound Installations [incl. "Audio Art: Notes Towards a Definition"]. **Avant** 19 (Summer 2001), 44.
- Sounds Heard at la Sainte-Baume [environmental music documentation]. **Musics** 5 (December 1975-January 1976), 11; reprinted in **A Selection of "Sounds Heard"** [q.v.]
- Statement. **Berner Zeitung** 4 December 1980 [in English and in German translation]; **A Selection of "Sounds Heard"** [q.v.]; **Musicworks** 57 (Winter 1994), 19; **Evenings of New Music (5): International Festival / Večery Novej Hudby (5): Medzinárodný Festival** [separate festival programme books; in English and in Slovakian translation], Bratislava, 1994, 78 / 78.

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AS COMPOSER/PERFORMER

- "Shozyg I+II"; **OU 36-37** (10" LP incl. with journal), 1970; CD reissue on Alga Marghen, in preparation]
- "Shozyg Sequence No. 2" [as "Solo Improvisation No. 2"]; **Strings and Springs**; Blank Tapes 8 (cassette), 1978
- "Music for Two Springs"; **Poésie sonore internationale**; Jean-Michel Place 10007 (cassette incl. with book by Henri Chopin), 1979
- "Music for Bowed Diaphragms" / "Salad" / "Shozyg Sequence No. 1" / "Spring Song"; **Shozyg: Music for Invented Instruments** (solo album); FMP SAJ-36 (LP), 1982
- "Shozyg Sequence No. 2". **Zeitkreis (1)**; Hans-Karsten Raecke (cassette; private edition), 1991 (also incl. duo/trio improvisations with Raecke/Ferdinand Försch)
- "Group Composition IV (Glastonbury Fair)" (excerpt) [as member of Gentle Fire]; "Live Electronics", **Contemporary Music Review** 6/1 (cassette; incl. with journal), 1991
- "Visiting Hugh Davies". **Other Sounds Vol. 1**; Trekanten Video Formidling, Copenhagen, 1991 (non-commercial demo videocassette)
- "Jigamaree"; **Musicworks** 57 (CD/cassette incl. with journal), 1993; [Reissued on the CD with this book]
- "Visiting Hugh Davies". **TVF Demotape #1: Other Sounds Vol. 1-11**; Trekanten Video Formidling, Copenhagen, 1994 (non-commercial demo videocassette, incl. reissue of 1991 videocassette)
- "Spring Song"; **Klangbilder: Hugh Davies/Hans-Karsten Raecke**; Klangwerkstatt edition SM 500 135 D (CD/cassette), 1994 (also incl. duo improvisations with Raecke)
- "Spring Song" (excerpt); **Transparent Messenger / Průsvitný Posel: Symposium Hermit - Plasy Monastery 1994**; Hermit Foundation AV 0057-2 931 (CD incl. with catalogue/documentation), 1995
- "Vision" (excerpt) [electronic music]; **Avant** 4 (CD incl. with journal), 1997
- "Madame Sin" [electronic sounds for film]; Avid 01223510743 (videocassette), 1998? / Carlton 30074 20393, 2000
- "Strata"; **Variations 2 - a London Compilation**; Paradigm Discs PD 05 (CD), 1998
- "Ring dem Bells" (excerpt; duo performance on own sound installation); **Resonancias** (CD incl. with exhibition catalogue, Málaga), 2000
- "Music for a Single Spring" (2 versions) / "Porcupine" / "Shozyg I" / "Shozyg Sequence No. 3"; **Warming Up With the Iceman: Solos by Hugh Davies**; Grob 324 (CD), 2001 (also incl. 2 solo improvisations)
- "Music for Three Springs (excerpt) and "Group Composition VI (Unfixed Parities)" (excerpt) [as member of Gentle Fire]; **Not Necessarily "English Music"**; Leonardo Music Journal 11 (2 CDs incl. with journal), 2001 / CDs also issued separately, EMF MediaEM 136-2, 2001

AS IMPROVISER

- The Music Improvisation Company**; ECM 1005 (LP), 1970
- Music Improvisation Company 1968-71**; Incus 17 (LP), 1976; CD reissue on Incus CD12, 1992; one track reissued on **Ocean of Sound**; Virgin AMBT 10 (CD), 1996
- Paul Burwell/Hugh Davies/David Toop; **Davies/Burwell/Toop**; Quartz/Mirliton QMC 6 (cassette), 1976
- Paul Burwell/Hugh Davies/Evan Parker; **Parker/Davies/Burwell**; Quartz/Mirliton QMC 11 (cassette), 1977
- Dick Beard/Hugh Davies/Tim Dennis: "Trio with Hugh Davies". **Pipe: Duos/ Collaborations**; Pipe PP1 (cassette), 1980
- Hugh Davies/David Toop; **Improvised Music & Sound Works**; Audio Arts 4/2 (cassette), 1980

- Circadian Rhythm**; Incus 33 (LP), 1980
 Borbetomagus: **Work on What has been Spoiled**; Agaric 1981 (LP), 1981
 Company: **Trios by Company**; Incus 51 (LP), 1986
 The Ferals: **Ruff**; Leo Records LR 138 (LP), 1987
 Peter Brötzmann/Hugh Davies/Phil Minton: "Sweet Suite". **Phil Minton: The Berlin Station**; FMP SAJ-57 (LP), 1987
 Hugh Davies/Hans-Karsten Raecke: "Klangbilder 1-4". **Neue Musik und Free Jazz in Duo**; Hans-Karsten Raecke (cassette; private edition), 1988
 Hugh Davies/Hans-Karsten Raecke: "Klangbild 5" and Hugh Davies/Ferdinand Försch/Hans-Karsten Raecke: "Drahtgestalten". **Zeitkreis (1)**; Hans-Karsten Raecke (cassette; private edition), 1991 (also incl. own solo composition)
 Hugh Davies/Hans-Karsten Raecke: "Klangbilder 1-3, 5-8". **Klangbilder: Hugh Davies/Hans-Karsten Raecke**; Klangwerkstatt edition SM 500 135 D (CD/cassette), 1994 (also incl. own solo composition)
 Hugh Davies: **Interplay** (duos with Max Eastley, Hilary Jeffery, Hans-Karsten Raecke, trios with John Russell/Roger Turner); FMR CD39-V0697 (CD), 1997; 2 tracks on **Avant 1** [CD incl. with journal], 1997 / 1 track on **Avant 13** [CD incl. with journal], 1999
 Hugh Davies/Max Eastley/Barry Leigh (excerpt; 1979 recording). **London Musicians' Collective... the first 25 years**; Resonance RES 8.2 CD/RES 9.1 CD [2 CDs incl. with journal], 2000
 Peter Cusack/Hugh Davies/Rhodri Davies/Phil Durrant/John Edwards/Kaffe Matthews/Marcio Mattos/Evan Parker/John Russell/Mark Wastell: **Strings with Evan Parker**; Emanem 4302 [3 CDs], 2001
 Hugh Davies/Max Eastley and Hugh Davies/Hans-Karsten Raecke. **A New Guide to Sound Sculpture and Invented Instruments, Vol. 1**; FMR CD80 (CD) [also incl. with journal **Avant 19**], 2001 [tracks reissued from **Interplay**, 1997]
 Hugh Davies: "Lunar Day" / "Solar Night" [solo improvisations]. **Warming Up With the Iceman: Solos by Hugh Davies**; Grob 324 (CD), 2001 (also incl. 5 compositions)
 Strings With and Without Evan Parker: **Freedom of the City 2001 - Large Groups**; Emanem 4206 (2 CDs), 2002 (also incl. London Improvisers Orchestra)

AS PERFORMER IN WORKS BY OTHER COMPOSERS

- Karlheinz Stockhausen: "Mikrophonie I". CBS SBRG 72647 (LP), 1967 = DGG 2530 583 (LP), 1976; CD reissues on Sony S2K 53346, 1993 = Stockhausen Gesamtausgabe 9, 1995
 Misha Mengelberg: "Where Is the Police?". **Derek Bailey: Solo Guitar Volume 1**; Incus 2 and 2B (LPs), 1971; CD reissue on Incus CD 10, 1992
 Richard Orton: "concert music 5". **Approach to Music, vol. 3**; Oxford University Press (17 cm EP; incl. with book), 1971
 John Furnival: "Ode". **John Furnival**; Ceolfrith Press CPR 1 (17 cm EP; incl. with exhibition catalogue Ceolfrith Press 14), 1971
 Earle Brown: "Four Systems" / John Cage: "Music for Amplified Toy Pianos" / Christian Wolff: "Edges". **Gentle Fire**; Electrola 1C 065-02 469 (LP) = Toshiba EAC-80295 (LP), 1974
 David Toop: "The Divination of the Bowhead Whale". **New and Rediscovered Musical Instruments**; Obscure 4 (LP), 1975 = Editions EG EGED 24 (LP); CD reissue on Virgin CDOVD478, 1997
 Karlheinz Stockhausen: **Sternklang**. Polydor 2612031 (LP) = DGG 2707 123 (LP), 1976; CD reissue on Stockhausen Gesamtausgabe 18A-B, 1992
 Talk Talk: **Spirit of Eden**. Parlophone CDP 74 6988 2 (LP) / TC-PCSD 105 (cassette) / CDP 74 6977 2 (CD), 1988 / digital remaster: EMI Records 7243 8 57129 2 0 (CD), 1997 (also in 3-CD set **Talk Talk**; EMI Records 7243 5 28343 2 7, 2000; other track reissues)
 Phil Minton & Vervan Weston: **Songs from a Prison Diary**. Leo Records CD LR 196, 1993

Hans-Karsten Raecke: "Reden ist Silber, Schweigen ist Gold". **Saitenwege Teil 2**; Klangwerkstatt edition (cassette), 1994

John Cage: "MusiCircus"(excerpt). Resonance RES 7.1 CD (CD; incl. with journal Resonance 7/1), 1998

Hugh Davies' invented instruments included in works by others

Michel Waisvisz: "Stradivarius". **Crackle**; Claxon 77.1/FMP SAJ-14 (LP), 1978

Alejandro Viñao: "Son Entero". **Prix Ars Electronica 1989**; Ars Electronica 89 (CD), 1989?

Alejandro Viñao: "Son Entero". Wergo 2019-50 (CD), 1990

In addition to some of the above, Hugh Davies has also contributed to other commercial recordings as a recording engineer and a contributor of sleeve/booklet texts (writer and translator)

IN PREPARATION: Gentle Fire (CD)

Hugh Davies (Exmouth, Devon, 1943) is a freelance composer, instrument inventor, performer and musicologist specialising in the new sound sources of the 20th century. He studied music at Oxford University, 1961-64 (BA), and was the assistant to the composer Karlheinz Stockhausen in Cologne, 1964-66. As a Researcher at the Groupe de Recherches Musicales of the French Radio in 1966-67 he compiled a catalogue of electronic music compositions (see below). From 1967 to 1986 he was the founder-director, and 1986-91 the research consultant, of the Electronic Music Studio, Goldsmiths' College, University of London. In 1986-93 he was an external consultant for electronic musical instruments at the Gemeentemuseum, the Hague. He has been a co-founder of several British and international contemporary music organisations, including Secretary of the newly-founded International Confederation for Electroacoustic Music (1982-86). Since 1999 he has been a part-time Researcher in Sonic Art at the Centre for Electronic Arts, Middlesex University, London.

As a composer, apart from more or less traditionally notated music for conventional instruments, Davies has primarily concentrated on electronic music (live and on tape) and music theatre, since 1967 especially on works for his invented amplified instruments. Among his commissions have been several works for modern dance groups. He has invented some 130 concert instruments, sound installations and sound sculptures, and given more than 180 solo concerts and lecture-recitals on his instruments, which are featured on over 40 published recordings. His compositions have been performed and/or broadcast in 25 countries, and his instruments, sound sculptures and other work exhibited in 12 countries. His CD of duo and trio improvisations **Interplay** was voted by the reviewers of *The Wire* as the third best CD of improvised music released in 1997.

Apart from solo performances, primarily on his own invented instruments, Hugh Davies also plays in duos with Hans-Karsten Raecke and Max Eastley, and is currently a member of Strings With and Without Evan Parker and the Electroacoustic Cabaret; previous groups have included Music Improvisation Company, Gentle Fire, Naked Software, The Ferals and Voices from Somewhere. In the autumn of 2001 he appeared as a guest soloist with the London Improvisers Orchestra. Although he is not a multi-instrumentalist in any traditional sense, on a variety of commercial recordings he not only plays a wide range of his own and other invented instruments as well as live electronics, but also clarinet (Stockhausen's **Sternklang**), Hammond organ (one track on the Music Improvisation Company's second album), toy piano (**Gentle Fire** album) and various non-Western wind instruments (**Circadian Rhythm**), as well as appearing as a singer (baritone, in Phil Minton and Veryan Weston's **Songs from a Prison Diary**). His many concert appearances have included the BBC Promenade Concerts on two occasions, playing live electronics in Stockhausen's **Mikrophonie II** and sampling keyboard in the world premiere of Jonathan Harvey's **Madonna of Winter and Spring**.

Davies' most recent activities include a greater concentration on sound installations. Following **Tintinnabularia Coloniensis**, a specially-commissioned "bell forest" for the underground ruins of the Roman Praetorium in Cologne (4500 visitors during its eight-hour opening), the publication of this book has been timed to coincide with the opening of a new sound installation at the Sirius Arts Centre in Cobh (Cork harbour), constructed during a residency there in April 2002.

Hugh Davies' writings on music have been published in 17 countries and translated into 11 foreign languages. Publications include **International Electronic Music Catalog** (compiler; 1968 - a revised version is planned for publication on the internet), 305 entries in **The New Grove Dictionary of Musical Instruments** (1984), 82 entries in **The New Grove Dictionary of Music and Musicians** (2nd. edition, 2001), 4 entries in **The Dictionary of Art** (1996), contributions to six other dictionaries and chapters in 20 books and exhibition catalogues. He has always combined practical musical experience with his researches. These largely cover areas of which he has had at least occasional experience, bringing inside practical knowledge to his research, while the deeper historical

understanding gained through his researches has often fed back into his creative work.

The main areas in which he is an acknowledged authority include:

- acoustic, electroacoustic and electronic instruments invented since the late 19th century
- sound sculpture
- the classification of electrophones
- electroacoustic/electronic music up to 1970
- the history of sampling
- drawn (optical) sound
- the instruments and music of Luigi Russolo
- music composed for mechanical musical instruments through the ages

Several of his articles can be found on the internet (listed in chronological order):

Goldsmiths' College, University of London: Electronic Music Studio (1977):

<http://music.gold.ac.uk/EMS/davies.html>

Neue Instrumente und Klangskulpturen: Ein Überblick; German translation of A Survey of New Instruments and Sound Sculpture (1987):

www.aec.at/20jahre/archiv/1987/1987_066.rtf

Prieľad nových nástrojov a zvukových skulptúr; Slovakian translation of A Survey of New Instruments and Sound Sculpture, with new postscript (1987):

http://www.slovakradio.sk/radioart/home/sitemap_hysp.html

Gesture in Live Electronic Music / Gesto v Živej Elektronickej Hudbe (1993); in English and in Slovakian translation:

www.slovakradio.sk/radioart/proj/ifem92/pages/davies_en.html

The Beginnings of Japanese Electronic Music (1993):

<http://www.kgw.tu-berlin.de/DegeM/Seiten/degem-media-frame.html>

The Sound World, Instruments and Music of Luigi Russolo (1994):

<http://www.l-m-c.org.uk/texts/russolo.html>

Contents of CD

For every track on the CD a corresponding text in this book has the same title, except for **Eine kleine Eierschneidermusik** (discussed in "The Eggslicer"). They can be found in the sections **Simple Invented and Found Instruments, Sound Installations and Related Projects, Scores, Projects with Children** and **Notes on Other Works Included on the CD**; most of the shortest tracks relate to "Seven Portable Found Instruments" (in **Sounds Heard and Environmental Music Projects**).

1. Interlude (1974) 5'14"

trio, musical boxes: Hugh Davies, Pam Davies, Rebecca Davies

2. Chinese Fan (1970) 0'33"

solo, found instrument: Hugh Davies

3. Collective Responses (1981) 5'02"

duo, sound installation: Hugh Davies, Julia Usher

4. Larchcone Clickers (1977); 2 larchcones 0'33"

solo, found instrument: Hugh Davies

5. Embellishments (1994/97); first version 3'34"

solo, sound installation: Rebecca Davies

6. Envelope Buzzer (1975); 2 buzzers 0'44"

solo, found instrument: Hugh Davies

7. Printmusic (1987; rev. 2002) 4'18"

Apple II computer and Epson dot-matrix printer (Hugh Davies)

8. Squeakbox (1969) 0'38"

solo, toy instrument: Hugh Davies

9. Jigamaree (1977) 8'27"

children's ensemble (Bonn), invented and self-built instruments, directed by Hugh Davies; concert recording

10. Conference Instrument (1976) 0'36"

solo, invented instrument: Hugh Davies

11. Taken for a Ride! (1967) 2'48"

monophonic 'plunderphonic' tape collage (Hugh Davies)

12. 3-D Postcard (1970) 0'59"

solo, found instrument: Hugh Davies

13. Organic Rhythms (1981) 7'49"

solo, sound installation: Hugh Davies

14. Composition with Cadence (1969) 0'18"

hand-operated toy musical box (Hugh Davies)

15. Eine kleine Eierschneidermusik (Eggslicer Quintet) (2000-01) 9'19"

quintet, eggslicers: Johannes Bergmark, Adam Bohman, Hugh Davies, Martin Klapper, Mats Lindström

16. Nut Whistles (1976); cob nuts and acorns 0'34"

trio, found instruments: Hugh Davies, Pam Davies, Rebecca Davies

17. Embellishments (1994/97); second version 8'48"

solo, sound installation; Hugh Davies

18. Lid Clickers (2001) 1'30"

trio, found instruments: Hugh Davies, Pam Davies, Rebecca Davies

19. Lady Bracknell (1971) 2'17"

solo, toy instrument; Hugh Davies

Total playing time 65'43"

all compositions by Hugh Davies (PRS)

joint composers of **Eine kleine Eierschneidermusik (Eggslicer Quintet)**: Johannes Bergmark, Adam Bohman, Martin Klapper, Mats Lindström



Complimentary CD
(Free when purchased with this book only.)

recording credits:

Taken for a Ride!: Hugh Davies, West Byfleet, 1967

Jigamaree *: Hugh Davies, Richard Felt and Richard Schaefer, Bonn, 1977

Organic Rhythms: Hugh Davies, London, 1981

Collective Responses: Hugh Davies, Colchester, 2001

Eine kleine Eierschneidermusik (Eggslicer Quintet): Martin Klapper & Johannes Bergmark, Copenhagen, 10/2000;

Mats Lindström, Stockholm 11/2000; Clive Graham, London 6/2001 (incl. final mix)

Embellishments (2 versions).

Printmusic: Hugh Davies, London, 2002
all other tracks: Clive Graham, London, 2002

Digital conversion and mastering by Clive Graham (Paradigm Discs)

* This recording of **Jigamaree** was previously issued on the CD/cassette accompanying **Musicworks 57** (1994)

Hugh Davies

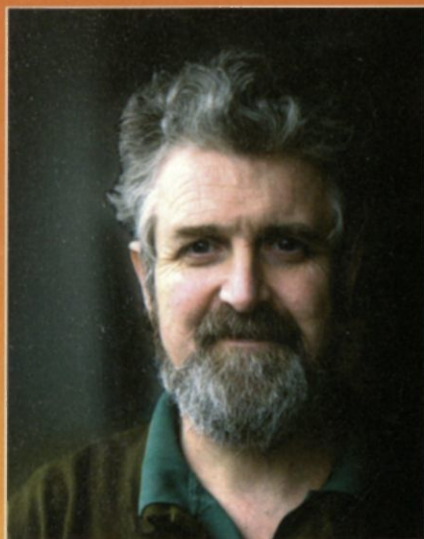
SOUNDS HEARD

A Potpourri of Environmental Projects and Documentation, Projects with Children, Simple Musical Instruments, Sound Installations, Verbal Scores, and Historical Perspectives.

Sounds Heard is not only a collection of writings intended for people who are interested or involved in contemporary music, especially those performers - including children - who lack a formal musical training. It also charts a wide cross-section of the activities of an intriguing musical personality. At different times in Hugh Davies' nearly 40-year career he has been variously described as "the world's leading electromusicologist", "the most informed person around on the general subject of new instruments", "unique English composer", "one of the most interesting instrument inventors of recent decades", "the remarkable live-electronics 'freak'", an "electronic wizard", "a humanist" and "I have never seen any music teacher who is as fond of children as he is". Do these really refer to only one person? Who is the real Hugh Davies? Why has his modesty prevented him from being better known?

This book focuses on many of Davies' insights about working an artist, a musician, a composer, a performer, an instrument inventor, an educator and a researcher. He takes nothing for granted, and there are always wider implications than his own immediate involvement. Even his more avantgarde scenarios are tempered with his "very British sense of humour". Many of the different areas of experimental music since the 1960s are touched on, including electronic music, live electronics, invented instruments, sound sculpture, sound installations and free improvisation, in all of which he was one of the British pioneers.

The CD illustrates a cross-section of the themes covered in the book. As with most of Hugh Davies' solo performances and recordings, no conventional instruments were used on the entire album, with the exception of one short piece in which existing music has been manipulated with tape techniques.



SOUNDWORLD

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