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## Echo Piece at Muddusjarvi

IN APRIL 1976 HOWARD SKEMPTON AND I visited Sweden and Finland to give some concerts of English experimental music, and to perform my environmental composition *Echo Piece* at Muddusjarvi in northern Finland.

I had previously visited Finland in April 1974 at the invitation of the English artist Ros Wayland who lives and works there; we had stayed for a week in Lapland, at Muddusjarvi, a horseshoe-shaped lake to the north-west of Inari. While exploring this lake and its surroundings we discovered a cliff on the northern side of its eastern arm which gave out a strong echo, clearly audible at a distance of quarter of a mile away on the frozen surface of the lake. For some time I had been interested in the acoustics of open air spaces, and in Lapland I was particularly impressed by the distinct resonance of sounds reflected not only from prominent natural features such as this cliff, but from all parts of the landscape. This is due partly to the coldness of the atmosphere, and to the sparseness of sounds of human activity. In the stillness of the early morning the barking of a dog, for example, is thrown back from the surrounding low hills with a reverberation time of up to ten seconds (comparable with that of a large building such as St. Paul's Cathedral). Using a woodblock which I carried with me to test environmental resonances, Ros Wayland and I discovered that by walking to different points on the surface of the lake we could produce clearly perceptible changes in the time-lag of the echo from the cliff, and in the timbral quality of the woodblock sound and its echo, and that different rhythmic relationships between a pulse (based on natural walking pace — one stroke played every two or four steps) and its echo could be explored by altering the relative positions of player and listener. The idea of a piece to be performed by two players with woodblocks, making use of the acoustic properties of this natural arena by moving around in the space, was worked out during the following days.

The musical context of this kind of work may be briefly mentioned. Our participation in experimental music since the time of the Scratch Orchestra (of which Howard Skempton and I were co-founders with Cornelius Cardew in 1969) had often included open air performances, and we were familiar with pieces such as those of Alvin Lurier which make use of spatial resonance and extended performance space.<sup>1</sup> I had also become interested in some of the work of visual artists such as Lawrence Weiner and Richard Long which has to do with defining perception of the natural environment.<sup>2</sup> The earlier music of Terry Riley and Steve Reich, although not specifically spatial, used echo techniques and rhythmic phasing: in his solo performances Riley used a mechanical 'time-lag accumulator', and some of Reich's pieces were based on a pulse which gradually moved out of phase with itself. It had occurred to me previously that rhythmic phasing could be transposed into real space, making use of the natural time-lag of sounds heard at a distance from their point of origin, but it was at Muddusjarvi that the plan took shape for a work incorporating movement of performers in relation to a natural echo.

Towards the end of 1975 Ros Wayland wrote to me that he had succeeded in interesting Finnish Television in the idea of filming a performance of *Echo Piece* at Muddusjarvi. I had some initial reservations about the idea of attempting to record this work, and about the disturbance to the natural environment which might be caused by the incursion of a television crew; nevertheless it seemed worth taking the chance of documenting it in this way and of presenting it before a public audience. I discussed it with Howard Skempton and we agreed to make Muddusjarvi our objective for the following April. Howard and I had been working together as a percussion duo for two years and had composed a number of pieces based on rhythmic systems for drums and woodblocks. We both saw the opportunity to perform *Echo Piece* as a valid extension of this kind of work.

We arrived in Helsinki on April 3, 1976 to find that there were differences of opinion within the Finnish Television hierarchy about whether the programme should be allowed to go ahead. Thanks largely to Ros Wayland's enthusiasm and powers of persuasion (he was to direct the film) these were favourably resolved; we seemed to have succeeded in reassuring those responsible for the production that this was not to be a mere stunt or 'happening', as some of them had imagined, but a serious piece of acoustic investigation. Five days later we arrived at Muddusjarvi with a team of sound technicians and cameramen, and recordings were made in the early morning on April 9 and 11.

Here follows a description of the four movements of *Echo Piece* as it was performed at Muddusjarvi.

1. Starting at the foot of the cliff the first player (M.P.) begins walking, playing a regular pulse on the woodblock (one stroke

every four steps), so that as he moves away the echo from the cliff gradually becomes audible. He continues until he reaches a predetermined point at which the echo is heard one second after each stroke is played. Here he stands still and stops playing.

(Taking the speed of sound as 1,120 feet per second, the distance from the cliff at which the echo is heard after one second is 560 feet.)

2. After a short pause the second player (H.S.) begins walking away from the foot of the cliff, at a slightly different angle from the first player, playing a stroke on the woodblock every four steps. On hearing the regular pulse of the second player, the first player standing still at the point he has reached begins playing a pulse in alternation, fitting in his strokes exactly halfway between player two's strokes as he hears them.

As the second player moves closer, because of the decreasing distance between them, the pulse as heard by player one appears to accelerate, so that he has to accelerate his alternating pulse to keep in time with it.

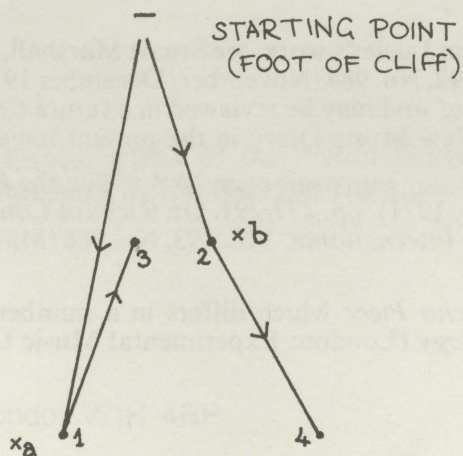
For player two, a further acceleration in player one's pulse (over and above the actual acceleration played) is apparent as he approaches; he should not respond to this, but should keep his own pulse and walking speed as constant as possible, while observing the changing relationship between his own and player one's pulse as he hears it.

Player two stops walking at a point half as far out from the cliff as the point reached by player one. Four pulses are now audible: the one played by each player, and the two echoes. The rhythmic relationship between them is heard differently by each player, and would of course be heard differently again by listeners in other parts of the space.

Both stop playing and there is another short pause.

3. Player one starts walking back towards the cliff (see diagram). This time he plays one stroke on the woodblock every two steps (double tempo). Player two, standing still, plays in alternation to player one's pulse as he hears it. Player one maintains a constant pulse and walking pace, while the rhythmic relationships which he hears change as he moves in relation to player two's position and to the cliff. He stops walking halfway back to the cliff, parallel with where player two stands, and both then stop playing.

4. After another short pause, player two walks outwards to a point parallel with player one's previous position (i.e. also about 560 feet from the cliff), playing a stroke on the woodblock every two steps. Player one, standing still, again responds by playing in alternation with player two's pulse as he hears it. This time player two's pulse appears to him to



decelerate as the distance between them increases, so he has to slow down his alternating pulse to keep in time. Player two maintains a constant pulse and walking speed, while observing the changing rhythmic relationships with player one's pulse and with the two echoes as he moves further away.

The length of this performance was just over 6 minutes.<sup>3</sup>

Because of their spatial separation, the rhythmic and acoustic perception of the event is different for the two performers at every stage. Other movements were also tried, but those given above were chosen because they gave the maximum possible variety within the physical limits of the situation.

For the stereo sound recording microphones were placed at points a) and b) (see diagram), about 300 feet apart. This gave a difference varying between 0" and ¼" in the time each sound was recorded, depending on the difference in distance of its place of origin from each of the two microphones. Both microphones were connected with long leads to the same tape recorder in order to ensure exact synchronisation. The recording thus created the impression of hearing each stroke played and each echo from the two separate points simultaneously.

It should be stressed that this or any other form of recording could only be a partial documentation of the event, which by its nature makes use of a constantly changing spatio-acoustic structure with no single point of focus. The primary purpose of the performance was not to make a recording as such, but to demonstrate some of the acoustic characteristics of the chosen location and of the movement of sounds within it. (This implies no reservation about the actual recording made on April 9, which was of excellent quality thanks to the skill and sympathetic involvement of the two Yleisradio sound technicians, Esko Tolonen and Esko Ranta.)

The woodblocks which we had brought from London proved inadequate, and so we tried out various found materials to produce a sound with sufficient carrying power: stones, pieces of wood, metal bars and so on. The ideal sound source was discovered by Ros Wayland on the morning of the first performance: a pile of pine and birch logs, selected pairs of which when struck together gave out a clear ringing note. This discovery enabled the performances to be given with materials integral to the environment itself — a much more satisfactory solution than the use of imported instruments.

The television version, filmed on the morning of April 11, was shot with two cameras placed at points corresponding to the positions of the microphones in the sound recording. The two cameras should have been fitted with crystal synchronisation units to ensure that they were running at exactly the same speed. Unfortunately the need for absolutely precise synchronisation seems not to have been fully appreciated, and these devices were not made available. After some delay and in spite of technical difficulties the editing of the film was completed in March 1977 by Ros Wayland and Erkki Kaikkonen in the Yleisradio studios at Rovaniemi. Because of the lack of precise synchronisation it was decided not to attempt to cross-cut or mix the two sound tracks, as had originally been intended; each movement is seen and heard from one position only, with a change of viewpoint occurring in the pauses between movements. The completed film includes in addition to *Echo Piece* an interview and discussion about the work, and a second section based on my piano piece *Arctic Rag*, with close-up colour photography of rocks, lichen, plants and other features of the landscape around Muddusjarvi. When the film was seen in Helsinki the programme production department suggested making some cuts in *Echo Piece* before showing it. Perhaps it seemed to them too sparse and uneventful in visual terms for normal television viewing. Ros Wayland and I have not agreed to any cuts being made, since these would inevitably interrupt the continuity of the rhythmic changes which define the space acoustically as the performers move from one point to another. It remains to be seen whether they will now agree to show it complete.

#### NOTES:

<sup>1</sup> For a recent article on Alvin Lucier's work, see Stuart Marshall, 'Alvin Lucier's Music of Signs in Space', *Studio International*, Vol. 192, No. 984 (November/December 1976), pp. 284-290. (This issue is devoted to 'Art and Experimental Music' and may be reviewed in a future *Contact*.) Marshall's own work in this field is discussed briefly in the New Music Diary in the present issue of *Contact*.

<sup>2</sup> On Lawrence Weiner, see Lucy Lippard's essay 'Art within the Arctic Circle' in her book *Changing* (New York: E. P. Dutton and Co., 1971), pp. 277-291. On Richard Long, see Andrew Causey, 'Space and Time in British Land Art', *Studio International*, Vol. 193, No. 986 (March/April 1977), forthcoming at the time we went to press.

<sup>3</sup> A previous version of *Echo Piece* which differs in a number of respects from the present one was published in *Visual Anthology* (London: Experimental Music Catalogue, 1974), p. 7.