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Teresa Balough, Kay Dreyfus (eds.): Distant Dreams. The Correspondence of Percy Grainger and Burnett Cross, 1946-60
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This fascinating account of the three-way 'Free Music' collaboration between Burnett Cross, Ella Grainger and Percy Grainger between 1946 and 1960 is an important addition to the literature. As well as its great interest to Grainger scholars, the book provides a highly informative case study of inter-disciplinarity that has a more general and contemporary relevance. Interdisciplinary collaboration is a pervasive aspect of today's research landscape, required by almost every funding council and scientific organisation. Its aim is to encourage productive interactions leading to innovations that provide creative solutions. A mono-disciplinary approach, it is often argued, is inherently limiting and so insufficient to address complexity.

The challenges of interdisciplinary collaboration are many. How may someone from one field credibly enter another? How may the gap between the 'Arts' and the 'Sciences' be bridged? How may the specialised language and practices of a discipline such as music or physics or engineering be understood by people who do not have that background? The answer, of course, lies in the ability of the collaborators to overcome such barriers, to respect and learn from one another's expertise, to share a common sense of purpose, to submit to a vision that is larger than any one of them.

This is resplendently true of the Cross/Grainger collaboration and, fortunately for us, the work undertaken by them has been thoroughly documented. This book provides a detailed account of the entire process (or series of processes) from ideation to realisation, complete with every problem encountered and solution found through the creativity of mutually respectful and open minds. It shows what may be achieved when all researchers suspend their egos and engage in genuinely collaborative enquiry, gradually gaining a deeper understanding of one another's approaches as they do so.

I have no hesitation in calling this "research". At its heart was an idea, a hypothesis if you will, that entered the mind of an eleven-year-old Percy Grainger when he "saw waves lapping against the side of boats in the Melbourne Lagoon" (141). Free Music was summarised by Burnett Cross as follows: "Percy was trying to break away from the established way of doing things, from the halftone scale, from the regularities of established music, [...] he was in fact searching for something new" (154). This spirit of adventurous questioning was what sustained the project for so many decades. The details of how it was to be implemented provided collaborators with a series of objectives, each of which superseded the

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previous ones and so produced endless re-invigoration and progress. In fact, as Cross observed, none of the Free Music machines was ever actually finished, because “as soon as a new machine began to work properly, and demonstrated what Percy wanted to hear, its disadvantages and inadequacies immediately loomed large, and we started to think about something better, a design of free music machine that would overcome the faults of the half-completed one” (158). Today, we would call such an approach ‘agile’, with an iterative feedback cycle leading to continuous improvements to a series of prototypes.

Each of the collaborators stressed the value of the others’ contributions. This is important to note, because the account of Ella Grainger’s work is necessarily less detailed, given that the documentation mostly takes the form of letters and other materials exchanged between the two men. Grainger wrote: “Each of the 3 of us has bright thought-germs [ideas] all the time & each evening sees the ways-of-doing-things of the morning left far behind and forgotten” (3), while Cross wrote: “I must say right away that Ella Grainger was a full partner in this labour—not only in the matter of supplying us with dinner, tea, cake etc., but in helping with what we were trying to do—with creative ideas and with labour” (169). The editors also comment: “though she is mostly silent, Ella Grainger too is continually reflected and refracted through the letters and the complementary daybook entries, completing a creative coalition of three” (Editors’ Note, xvii).

One of the things that made the collaboration so successful was that none of the participants saw it as anything other than a labour of love, driven by Percy’s desire for a kind of democratic approach to music that could be independent of human performers and yet relatable, especially through the construction of the instruments from homespun and domestic materials. The various unproductive encounters with university-based engineers and academics who were working on early synthesizers and other electronic instruments at the time are revealingly described. The inaccessibility of such machines and their need for ongoing and expensive maintenance represented an insurmountable barrier. For Cross, the music they produced was also uninspiring, although Percy Grainger had less to say on that score.

For Percy, of course, Free Music was the climax of all his musical endeavours, in his opinion his only lasting contribution to music. For Burnett Cross, on the other hand, the project contributed to his developing thesis that the supposed objectivity of science is largely a fiction. As he puts it: “The scientists’ communication network is eminently social. There is still another dimension of the scientific method, the extrarational, which includes chance and intuition”. Quoting H. G. Wells, he states: “Swapping wisdom, that’s the true scientific method [...] Scientists collaborate” (170 f.). It is abundantly clear from this book that Cross would not have been able to be so secure in this conclusion without his many decades of collaboration with the Graingers. Since he was a teacher of considerable renown, these ideas have since found their way into the minds of many young scientists.

One of the major objectives of the book is to counter the received wisdom that Burnett Cross was a mere technical assistant to Percy Grainger. This it achieves very well, showing that this was a collaboration in which all parties shared equally, each contributing their own particular expertise and indeed personality.

As Percy aged and became unwell, Burnett increasingly drove the project, but never in a way that would diminish the composer's central position. The Electric Eye Tone-Tool was clearly Cross's own creation, but it is equally clear that he understood that it would not have existed without Grainger. By that stage in the collaboration, the depth of their mutual understanding was such that this was never in question. There was certainly trust and indeed affection between them but, more than that, there was a harmonious relationship between their respectively convergent and divergent thinking, between scientific method and artistic creativity.

This is touchingly brought home in some of the exchanges where Grainger indulges in rueful self-criticism. In a letter written aboard the S. S. Stockholm (many of Grainger's letters are written in transit during concert tours) on June 22, 1950, he begins: "As I look back on my life as a tone-wright [composer] I am aware of having failed again & again thru lack of bravery rather than thru lack of giftedness" (41). The substance of his argument is that by letting his lighter music go first into the world he avoided the difficult challenge of putting forward more experimental works. He contrasts this lack of bravery with Cross's bravery and speed in his scientific work and teaching. Cross replies calmly that Grainger's self-accusation of "lack of bravery" is misplaced because the experimental works were: "Difficult to perform, perhaps, yes; that is no serious barrier. But they lie on a level of expression toward which we move (I think) but errantly and have scarcely touched" (46). Seven years later, while writing appreciatively of the Electric Eye Tone-Tool experiments, Grainger declared: "I have held things back by being too bodily, too mechanical" (122). It is certainly true that almost all Grainger's contributions comprise mechanical solutions, and that Cross himself moved things forwards by introducing electronics. But Cross's reply is clear-sighted: "As for your suggestion that you have held things back by being too mechanical, I beg to demur. The photo cells available until recently were, as we noted, very unstable and out of the question for playing music with any degree of accuracy at all". There may be an element of politeness here, of giving succour to a sick man but, if so, it is very well concealed behind Cross's characteristically rational take on the situation. No, this is just a reasoned reply to an unfounded self-criticism that reflects the scientist's admiration for the composer's ambition and Cross's experience over decades of Grainger's immensely pragmatic approach and energetic solutions.

The bulk of the correspondence is a full documentation of all this, copiously and marvellously illustrated with drawings by both men in their different styles. There are also several valuable photographs and a highly informative commentary that is both thoroughly researched and insightful. Most letters contain detailed discussions of the technical workings of various Free Music machines, along with more speculative writing and discussions of music. Burnett Cross's mother, herself an accomplished musician, provided an additional point of connection and organised several performances of Grainger's work. Cross emerges, to his own surprise, as a trusted singer of Grainger's 'Bold William Taylor', of which he made a recording in 1949. He also helped with the folksong transcription projects and, most importantly, he created the 'Piano-Desk-Roller' or music

roller that Grainger used throughout the 1950s as his memory became less reliable. This alone was an enormous act of support, and it clearly gave Grainger much comfort as his anxieties increased.

Perhaps the most interesting letter (at least, to this reader) is the one sent by Burnett Cross on 15 November 1955 in which he describes his thoughts as he prepares to write a book on the relationship between music and science. He says: “It seems that scientists are at long last beginning to investigate the question of the mathematical relations of musical intervals in a scientific way. Having stated for some centuries that the octave ratio is 2 to 1, the physicists are now beginning to wonder just what evidence they have for that statement—since they have never examined any number of people on the subject” (100). He goes on to describe some experiments in which people hear an octave as more like 2.04 to 1. This insight really summarizes the cross-fertilisation between the two men. On the one hand, Grainger sought to develop a machine-based music that removed the human element from musical performance, while on the other hand Cross sought to embed human perception into the supposedly abstract and perpetual laws of mathematics and physics.