

Tomorrow's World

The Workshop was founded in '58 to satisfy the growing demand for radiophonic sounds for use in television and radio. It saw a stellar procession of talent, most notably Daphne Oram and Delia Derbyshire, and soundtracked such classics as *The Hitchhiker's Guide to the Galaxy*, *Blake's 7*, *Tomorrow's World* and, most famously, *Doctor Who*. Rather than recount the oft-told history of the Workshop, we got time with some of their venerable alumni to give their take on the achievements of the groundbreaking institution.

DICK MILLS

Dick Mills joined the Workshop in '58 originally as a technical assistant, later going on to engineer the music for many Workshop favourites such as *Doctor Who*, *K-9 & Company* and *Moonbase 3*. He also participated at The BBC Radiophonic Workshop reunion at the Roundhouse in Camden in 2009.

"With *Doctor Who* celebrating its 50th Anniversary it is really scary to think we're now part of the nation's fabric"
Dick Mills

Shindig!: How would you compare the music made at the BBC to other organisations or people making futuristic sounds at the time?

DM: There is no comparison! But I would say that anyway, wouldn't I? Seriously, though, the answer isn't as flippant as it might at first appear. Naturally we were aware of other composers' ventures in the same field – Pierre Schaeffer, Karlheinz Stockhausen, Les Structures Sonores etc but there was one difference that seemed to set us apart which most people don't consider. All other composers worked within their own disciplines – to suit their own creative purposes, so to speak. We, at The BBC Radiophonic Workshop, were an in-house programme facility offering our services to any programme department within the BBC – Radio, Television, World Service – that thought they could benefit from our talents. Suddenly, creative

For a child growing up in the '60s, hearing the *Doctor Who* theme tune for the first time must have felt like listening to music emanating from a different planet. Along with 'Telstar' the theme to the legendary sci-fi series must truly be recognised as the foundation stone of the whole spacerock genre, writes AUSTIN MATTHEWS. The theme was of course written by Ron Grainer and realised by Delia Derbyshire at the BBC RADIOPHONIC WORKSHOP

pro prowess wasn't enough, as transmission (or studio recording) deadlines had to be met, including the immediate worry of satisfying the "customers" needs in the first place. Pressure, or what? We never sprang into action unless a commission was received and, in this way, all our experimenting and research into this art-form took place at someone else's behest.

SD: What do you remember of people's initial reaction to hearing things like the *Doctor Who* theme tune for the first time?

DM: It is fair to say that whilst the immediate impression was excited and favourable, most people were more interested in how the accompanying visuals were made! Remember that *Doctor Who* came along around five years into the Workshop's life, during which time listeners and viewers had had an increasing exposure to our audio output. Nowadays, people are staggered that the signature wasn't made using any musical instruments, synthesisers, multi-track tape machine and computers.

SD: How influenced were you by science fiction when you were growing up and subsequently later when you came to the Workshop?

DM: *Eagle* comic obviously has a lot to answer for! Not only for its Dan Dare plots but also its fantastic cut-away diagrams which used to feature as regular centre-pages. Fortunately, I could always suspend belief enough to enjoy science fiction and hardly ever doubted that such things could possibly happen.

SD: Can you describe to me some of the experiences of working on *Quatermass & The Pit* ('58-'59)?

DM: *Quatermass & The Pit* was obviously based around the re-construction of the London Underground as new lines such as the Jubilee and Victoria were built. Only a short leap of imagination was required to believe that something nasty remained buried underground for so long as was 're-awakened' albeit mentally to affect the workers. Apart from helping to produce sounds to reflect such mental turmoil – not a particularly hard task seeing that our primitive equipment seemed to produce anguished, distorted sounds at the drop of a hat – was the curious paradox under which our output was made and, eventually, used. It is common knowledge that magnetic tape was our working medium but, at each of the production line, recorded disks played their strategic parts. Sometimes original, pre-recorded sound effects (from the BBC vast sound effects library) were used and then manipulated via tape and electronic treatment to form our contribution. Then, these sounds were then re-recorded back to disk for use in the production studio. For *Quatermass* (probably the first



Daphne Oram's 'Oramics Machine' – which uses a 'drawn sound' technique to create music

production I worked after arriving at the Workshop), I had to "cut" a duplicate set of 144 acetate disks – one set for rehearsal and another for the recording.

SD: *Quatermass & The Pit* was cited by Pink Floyd's Syd Barrett as a major influence – were you conscious that the Workshop's music had had an effect on rock musicians?

DM: Once people became more conscious of the Workshop's output it was inevitable

(our studios weren't isolated from main corridors or anything like that) couldn't help overhearing our experiments and naturally some took time to talk to us. It was the studio managers at the Workshop who became the focus of interest (they tended to work on into all hours!) and there are several tales of now-legendary musicians who paid us a call at one time or another. I think there is a black and white photograph of Pink Floyd in Room 12 existing somewhere.

SD: How was music created at the Workshop?

DM: A short explanation would not come amiss here to mention our "working practices." At first, each commission would be undertaken by a team of two – a studio manager (the creative one) and an engineer (the technical one), although eventually the notion that either one could work solo proved to be the impetus that caused the Workshop's expansion into its final six, individually-staffed, custom-built studios. Having said that, we never turned into individual recluses and usually took communal lunch together where various topics were discussed. Our "togetherness"

"Our primitive equipment seemed to produce anguished, distorted sounds at the drop of a hat"
Dick Mills

that some folk would take more than a passing interest. Being situated within the BBC's music studios complex at Maida Vale also meant that any passing musician

Dick Mills in his Workshop studio in Maida Vale shortly before retiring in 1993



probably was at its highest when the Workshop was responsible for both special sound and incidental music for a complete *Doctor Who* season; it was so easy to collaborate with a composer in the next room should a conflict of interests occur.

SD: Was there a push towards experimentation for its own sake or was everything done with a view to its overall usefulness as an effect or a soundtrack piece?

DM: The old adage “Do you want it good, or do you want it tomorrow?” springs to mind! We did have a theory that when you arrived at the moment when you thought everything was as good as it would ever get, the best thing to do then was to actually go back a process and that was your best effort. After that you were merely polishing the polish.

SD: Were you influenced by the sci-fi soundtracks of the '50s such as *Forbidden Planet* ('56)?

DM: I think, with precious gift of hindsight, I didn't do as much listening to things as many people assume I did. I'm not quite sure where this leaves me!

SD: Was Joe Meek's work an influence at all?

DM: Now I definitely remember 'Telstar' but it was the work of a much earlier radio personality that unconsciously grabbed my attention. Jack Jackson was a radio disc jockey from the '50-70s whose programmes often took a theme, or storyline, connecting the hits of the day. Constructed with great skill, the “stories” were pure invention for radio, combining perfect timing and technical skills including a lot of the sort of “sound pictures” dear to any “sound designer's” heart.

SD: As time went by how would you describe the evolution of the music coming from the workshop?

DM: Closely tied to the introduction of synthesisers and keyboards, the emergence of local radio, with their demand for “Station Ident” jingles drove the Workshop down a different path altogether.

Whilst the Workshop had been set up to provide special sounds for radio drama (although our biggest customer was probably Schools Radio!), another strong impetus was the emergence of better equipment that allowed production of distortion-free material. Desmond Briscoe, co-founder of the Workshop, often said that in sound terms “It was very easy to be ugly but far more difficult to be beautiful.”

Again, probably exposure to the public meant that the Workshop's output became easily acceptable and that led to the commissioning of larger works such as natural history programmes like *Ascent of Man* ('73) and *The Living Planet* ('84).



“Delia Derbyshire's work on *Doctor Who* was, without doubt, one of the first steps that electronic music took to merge the new with the old”
Ray White

SD: How would you go about creating music for the BBC's science fiction programming?

DM: The words and plot ideas always come first! Getting inspiration from these, and then close discussions with the producer/director paves the best way forward. After that, it's just a case of knuckling down and getting things done in time!

A lot of factors come into play along the way, such as the style and relationship to content, especially visuals if it is for television. In radio, where the listener provides his own mental image of the “scenery” you could be at an advantage.

SD: Is there any one person in the Workshop's history that you think was fundamental to the overall development?

DM: Again, when forced to choose from some many creative people encountered throughout my Radiophonic life, from within and outside the BBC, it seems unfair to be asked to single out one individual. However, none of anything I've done would have been possible without the vision of the Workshop being set up in the first place and for that I should thank Daphne Oram for its original conception together with Desmond Briscoe for taking up the baton and running with it so far into a future that none of us could have envisaged at the time.

SD: Which piece of music that you worked on are you most proud of?

DM: Years ago, I was asked to help in cataloguing the Workshop's entire output, in the cause of conservation. In the process, I quite surprised myself in discovering just how many “musical” items I had composed. I remember only too well coming home with a cassette copy of one piece I was particularly pleased with to play to the family, only to be told that most of them didn't want to be in the same room when it was playing!

SD: Are you proud now to look back on the legacy of what was achieved?

DM: With *Doctor Who* celebrating its 50th Anniversary it is really scary to think we're now part of the nation's fabric. With the pace of today's technology, it's been a privilege not only to be part of it but also to just about be able to keep up with it.

I am truly amazed at the public's continuing interest and respect for what for us should have been all in a day's work, using outmoded methods and equipment, but it was much better than that – it was fun!

RAY WHITE

Ray White became Senior Engineer at the Workshop in '79. He runs an incredibly detailed website telling the full story of the Workshop at <http://whitefiles.org/rws>

Shindig!: How would you compare the music made at the BBC to other organisations or people making futuristic music at the time?

RW: The Radiophonic Workshop's first works sounded much like those created by others working in experimental music in the '50s and early '60s, most of whom were on the continent. However, the “special sound” produced at the Workshop was designed purely to accompany radio and TV programmes: it wasn't intended to be listened to as music. In fact, the Workshop was established so as to avoid any conflict with the BBC's Music Department, who feared that electronic music would move into its territory. Also, whilst other pioneers thought their music to be ‘high art’, those of the Workshop had to cater for a much wider audience.

The first half of the 20th century saw the world of “modernism” and the *avant-garde* moving into all of the arts, throwing over classical traditions of instruments and musical forms, tossing out conventional instruments, along with the old ideas of melody and rhythm. Such ideas weren't particular popular with the public, who continued to enjoy music of a traditional form. The “futurist” Luigi Russolo wrote in 1913: “Futurist musicians must substitute for the limited variety of tones possessed by orchestral instruments today the infinite variety of tones of noises, reproduced with

appropriate mechanisms.”

Pioneers of the '40s, such as Pierre Schaeffer in Paris, modified existing sounds to create this new kind of “music”, whilst Karlheinz Stockhausen in Germany formed his sounds from scratch using pure electronics. Both of these experimenters would have been appalled at their efforts being used as sound effects or music for radio or television: they considered their works to be complete, pure art in themselves.

Schaeffer's ideas were pushed forward by the arrival of the tape recorder after the war, which allowed natural sounds to be modified in ways never heard of before. Such modification techniques, such as speed variation, reverse playback, the use of tape loops and tape delay were known collectively as *musique concrète*. Others, including Tristram Cary, who later worked alongside his BBC contemporaries, also experimented with such processes, mainly in work for radio and television, whilst the composer Edward Williams, who later produced the music for *Life On Earth* ('79), wrote of an earlier work: “...I did the music for *Between the Tides* ('58), which was the next natural history film. It was my first electronic film and my technology was like this: I wrote some piano music and I took it round it to my friend who had a studio and said 'electronic it up for me will you please?' And he put lots of echo and that kind of thing. It sounded quite sort of weirdish then.”

Later, during the '70s, IRCAM (France),

appeared, moving forward the “pure art” ideas of Schaeffer and Stockhausen, but The Radiophonic Workshop carried on making its distinctive sound and music for radio and television. Others from the world of rock music, such as Robert Fripp and Brian Eno also used *concrète* in their earlier works, some of which eventually found new uses in film and television.

SD: What do you remember of people's initial reaction to hearing things like the *Doctor Who* theme tune for the first time?

RW: I was only 11 when *Doctor Who* was first broadcast ('63), so I think most people had heard it by the time I started work at the BBC. As a child, I found the music very exciting and would dance to it. In those

“Daphne Oram was a exceptionally talented and dedicated experimenter, eager to wield the soldering iron at any opportunity to achieve what she wanted”

Ray White

days few adults would have considered that, but times have changed, and it's now recognised as valid prototype of today's dance music. To be honest, I consider Delia Derbyshire's original version to be the very best, the spookiest, the eeriest and most atmospheric. It conveys exactly the spirit of the '60s “space age”.

SD: Was there a push towards experimentation for its own sake?

RW: Experimentation was something that often had to be squeezed into the time needed for producing music and sound. Although the original leader of the Workshop, Daphne Oram, was a exceptionally talented and dedicated experimenter, eager to wield the soldering iron at any opportunity to achieve what she wanted, the corporation needed a more focused approach, which resulted in her departure and the appointment of the pragmatic and practical Desmond Briscoe in her place.

The BBC, always funded by the TV licence-payer, had always to keep an eye on the purse. The Workshop was a service department, so every penny had to go towards pleasing the customer, the radio or TV producer. Experimentation in itself was a luxury that simply couldn't be afforded in the early days. Things improved by the '80s, when the department, under the expert guidance of its new head, Brian Hodgson, gained a proper annual budget. The development of digital studios in the '90s required more experimentation,

Daphne Oram at work in the Workshop



ff9925cd-09cd-4e48-8422-cffff620bd2

especially from Peter Howell and also by a series of “technical co-ordinators”, namely Jonathan Gibbs, Mark Wilson and Tony Morson, all of whom made very useful contributions to their design, which were completed by myself, ably assisted by Ray Riley.

SD: As time went by how did the music coming from the Workshop evolve?

RW: The Workshop when it closed in '98 was an entirely different animal to that which opened in '58. At its beginning it didn't produce much “music” as such, in line with the agreement with the BBC's Music Department. The department produced five broad areas of material: (1) “special sound” – used in early radio dramas, (2) *concrète* sounds – used in early works to replace real sounds, creating a dreamlike atmosphere to the production, (3) sound effects – such as a sliding door or the sounds of action in *Doctor Who*, (4) incidental music – used to heighten the sense of drama or atmosphere in a radio or TV programme, and (5) title music – used in opening and closing sequences.

In the early days “special sound” was the Workshop's main purpose, but by the '90s experimental radio drama had faded away or moved into different realms. Prior to the creation of the *Doctor Who* theme in '63, the Workshop didn't create much that could be understood as ‘music’ at all: notable exceptions include *Science and Industry*, created by Phil Young and Maddalena Fagandini in '59, and the Interval Signal of '60, also by Fagandini.

The arrival of the voltage-controlled synthesiser changed things: the huge amount of *concrète* work that Delia Derbyshire used on the *Doctor Who* theme was no longer required, but the early machines were very difficult to approach by a musician, presenting other challenges. Delia attempted to produce a new version of the theme on the EMS *Synthi A*, but the result was pretty dreadful. Only when the new microprocessor-controlled synths arrived in '80s was it possible to easily create music. At its end the Workshop was producing more music than anything else: in fact, it had become a “music factory”, a place where music could be created at low cost, without the need for “difficult” musicians or expensive orchestras: a dubious role in many ways.

SD: What one figure from the workshop do you credit as the most pivotal?

RW: It has to be said that all of the composers at the Workshop were extremely talented: they had to be in order to meet the requirements of highly demanding radio and TV producers. Despite this, and at the risk of sounding predictable, Delia Derbyshire has to stand out, not just because of her exceptional talent, but because she made a very brave and pioneering step, in

the right place and at the right time. She took the theme tune of *Doctor Who* that had been scribbled down by Ron Grainer, the composer of other quite innocuous title music, such as the theme for *Z Cars*, and used ‘concrète’ techniques, along with the output of a bank of oscillators, to create something entirely different. Not only was this a real tune, unlike most of the Workshop's earlier output, but it had been created using the very avant-garde techniques avowed by those that rejected the notion of conventional music. Working alongside Dick Mills, she used ‘concrète’

“I remember so well the very first episode of *Doctor Who*. I had never seen or heard anything like it, the theme tune felt completely out of this world”
Elizabeth Parker



techniques to the furthest extremes, looping and dubbing again and again, certainly beyond what had ever been done before or since. The result was a shock, Grainer famously saying, “Did I really write this?” to which she replied, “Most of it.”

I met Delia only once, and you only needed to meet her once to know that she had a great understanding of many things. She fully appreciated the mathematical relationships that are the foundations of classical music. Grainer's original tune followed those rules, rules that Bach would have understood and Delia fully respected.

So she took it and reconstructed it for a different world, a postmodern world, an age where the traditions of the past could live alongside the technology of the new. Delia had many connections in the world of pop music, including The Beatles, who began to reuse elements of older music later in the '60s, most notably in *Sgt. Pepper* and their later albums. Delia's work on *Doctor Who* was, without doubt, one of the first steps that electronic music took to merge the new with the old.

SD: What influence do you think the Workshop had on the rock music scene at the time?

RW: It's extremely difficult to assess the impact of one group of people in the field of music on another, since, as with all activities, there's constant cross-fertilisation. In his excellent book, *Special Sound, The Creation and Legacy of the BBC Radiophonic Workshop*, Louis Niebur says: “We in the twenty-first century are surrounded by electronic music. And... the Radiophonic Workshop... had a significant role in creating this state of affairs.”

I suspect that few people could argue with that. Certainly Pink Floyd visited the Workshop in '67 and it's also reported that Jimi Hendrix and Brian Jones of The Rolling Stones came to see the studios, whilst Delia Derbyshire did some work with The Beatles. Having sown such seeds, it's hardly surprising that the output of the modern music industry is scattered with sounds that are so similar to those produced by The BBC Radiophonic Workshop.

ELIZABETH PARKER

Elizabeth Parker joined the Workshop in '78 and was the last remaining composer employed there when it shut down in '98.

SD: Do you remember the first time you heard the *Doctor Who* theme tune?

EP: I remember so well the very first episode of *Doctor Who*. I had never seen or heard anything like it, the theme tune felt completely and literally out of this world. I remember being quite scared but incredibly excited. The theme tune set the whole scene for the programme, absolutely brilliant and iconic!

SD: When it came to composing music for science fiction programmes did you take your inspiration from previous members of the Workshop?

EP: No, I very much wanted to do my own thing, for (the *Doctor Who* four-parter) ‘Stones Of Blood’ ('78) I sampled my own gurgles, slowed them down, layered them up, classic *musique concrète* techniques so the stones sounded like they were oozing blood. Writing for sci-fi programmes is made easier by all the brilliant synth sounds available, ethereal, spooky, you name it, there is a synth sound out there, so the

trick is to add your OWN created samples and mix and match, so to speak, to create a new sonic landscape that no one else has discovered....

SD: What is the piece of music you composed at the Workshop of which you're most proud?

EP: I suppose it HAS to be *The Living Planet* in '84. I was using the brand new German PPG synth plus wave term sampler, (only two in the country, the Pet Shop Boys had the other one!) and it had a nasty habit of crashing when you least wanted it to, which was a nightmare. But it meant I had a dedicated sampler to use, and the sound score very much reflects the breadth of sound that I was able to achieve from that synth. It started a career long affiliation with Natural History. Up until then, scores had been largely orchestral so it was absolutely new to have a 13-part series done entirely with a Radiophonic score. I wanted the music to blend into the film more than an orchestral score could, using loads of hand-created samples. Every line of every cue was played onto an eight-track recorder with complicated sync blips, then mixed by me, truly an epic labour of love for what was in effect my first proper TV commission at the Workshop.

SD: What one figure from the Workshop do you credit as the most pivotal?

EP: It surely has to be Delia Derbyshire? Her legacy has lived on and influenced so many new composers. It's just a shame I never worked with her, it might have been epic!

RICHARD ATTREE

Richard Attree was the last composer recruited into the Workshop in '87. During his time there he won several prestigious awards for his work.

SD: Did you watch *Doctor Who* growing up? Did the themes have an impact on you?

RA: Yes I do, and yes it did. I do remember seeing the first episode, so I guess I must have been 10 (born in '53). I've always loved the first version of the theme. So innovative at the time and with that very analogue, slightly "rough-around-the-edges" feel (famously slightly out of tune on the top synth line because of how it was done with oscillators). Later versions were increasingly "smoother" and "bigger" as the technology improved but never had the same unique feel as the original.

SD: Was it daunting to join the Workshop given the rich history?

RA: Yes and no. Obviously I was well aware of the history, but at the time I wasn't overly bothered about getting a "proper" job – I was playing in bands etc at the time and very much "free and single". I was



Delia Derbyshire and Desmond Briscoe in the studio in 1965

"I've always loved the first version of the *Doctor Who* theme – famously slightly out of tune on the top synth line because of how it was done with oscillators"

Richard Attree

actually the first (and last) composer that was taken on without going through the official BBC training / apprentice path to getting a job there. The daunting aspects were more to do with it being my first full-time (corporate) employment rather than the actual work. For me, it was like being a kid in a toyshop with all the latest kit (eg a Fairlight with all the cards in it, as opposed to the one I had been using at The City University with most of the cards missing).

SD: How would you create music at the Workshop?

RA: I was perhaps the first composer there who had grown up more with sequencing than multi tracking. The others were very experienced with using 16 and 24-track tape but I had been using one of the first

composing "languages" on the Fairlight. I think it was called MCL (or similar) and was a kind of pre-midi sequencing system. Big advantage being that you could edit anything at any time. I also embraced sampling as soon as I could (mid-80s) – using firstly the Fairlight and then the Emulator.

SD: What do you recall of the decisions and circumstances around the closure of the Workshop?

RA: A very difficult and sad time for all of us. To be honest the whole of the last year felt like the place was falling apart. We had several fractious meetings about how we could turn things around commercially after the BBC introduced "Producer Choice" (ironic name for pseudo free-market economy within the BBC – a bit like what's happened to the NHS). It was pretty clear to me that the writing was on the wall after they finally appointed a marketing person (from Rumbelows, who had just gone bust!) and we were invited to do a presentation to justify our existence. We did this fantastic surround-sound show with graphics, pulled out all the stops about how wonderful the Workshop was, then she just produced a few pie charts to show exactly how unviable we were economically. The next thing was a few days before Christmas she went round each studio and made us all redundant. To be honest I was expecting it and I then had three months notice to set up as freelance – which I did quite happily for the next dozen years. In 2007 I retired from the music business to be a professional beach bum in Tenerife.