

MT Interview Radiophonic Workshop

THE ULTIMATE STUDIO ICON

The Radiophonic Workshop was founded nearly 60 years ago and over four decades, influenced generations and left an indelible musical legacy. **Andy Jones** explores its history and speaks to Paddy Kingsland and Mark Ayres about the Workshop's live revival – and the first new Radiophonic album for 32 years...

Pictures Victor Frankowski, Colin Neal and York Tilyer (Real World) | **Historic photos** thanks to the BBC Archives

The importance of the BBC's Radiophonic Workshop can't be understated. From the 1960s onwards, it not only scored much of the BBC's TV and radio output – both in terms of sound effects and music – but also became something of a Mecca for bands interested in utilising the equipment and skills there. Its output has influenced countless numbers of today's producers and was all down to a set of pioneering composers and technicians who employed new, old and even scrap gear to come up with unique sounds.

The first of those pioneers was Daphne Oram. As far back as the 1940s, Oram was a junior studio engineer at the BBC who was becoming increasingly fascinated with tape editing and electronic sound. She composed as she experimented and one of her pieces, *Still Point*, is seen as the first composition to combine the worlds of an acoustic orchestra together with live manipulated sound – Oram planned to use turntables to play back edited orchestral music along with a live orchestra, but the piece was never actually performed until after her death.

In 1957, Oram produced the very first electronic score the BBC broadcast, for a play called *Amphitryon 38*, using what could be

called a simple synth comprising a Sine-wave oscillator and homemade filters. In the same year, she teamed up with studio producer Desmond Briscoe over a shared enjoyment of the French *musique concrète* style of music, and the two started producing similarly themed experimental scores and sound effects. So in demand did these become that the BBC gave the pair a budget to set up what would become the Radiophonic Workshop in 1958 at the BBC's Maida Vale Studios.

With £2,000 and access to as much unwanted and disused equipment at the BBC as they could get hold of, the

her displeasure at the direction that the Workshop was taking as a reason. The numbers were further bolstered by the arrival of Brian Hodgson, David Cain and John Baker. Even a young George Martin briefly entered the fray in 1962, to help turn one of Fagandini's pieces, *Time Beat*, into a commercial release, a first for the Workshop. Of course, Martin would go on to taste slightly more commercial success over at Abbey Road Studios a little later in the 1960s...

The Workshop was initially one large studio, with an area for the gear which was then tape machines,

oscillators and all sorts of ragtag pieces of equipment, which were picked up from everywhere – including local markets, BBC

/// Brian Hodgson created the TARDIS sound by dragging a door key along a piano's bass string ///

Workshop soon expanded and notable early work included effects for diverse productions, including the sci-fi drama *Quatermass And The Pit* and *The Goon Show*.

The Radiophonic line up would change in the early 60s. Maddalena Fagandini joined and among many scores, she also came up with some incredible effects for a radio version of Jean Cocteau's *Orphée*. Delia Derbyshire, a third female composer who would make a huge impact on the Workshop's success, also joined in the early 1960s – although, by this time, Oram had left to concentrate on her own electronic music, some citing

offcuts and even ex-military auctions. This equipment was ripe for all sorts of otherworldly sound effects and music, so it's no surprise that the biggest impact was made with the then-new BBC production, the sci-fi TV show *Doctor Who*.

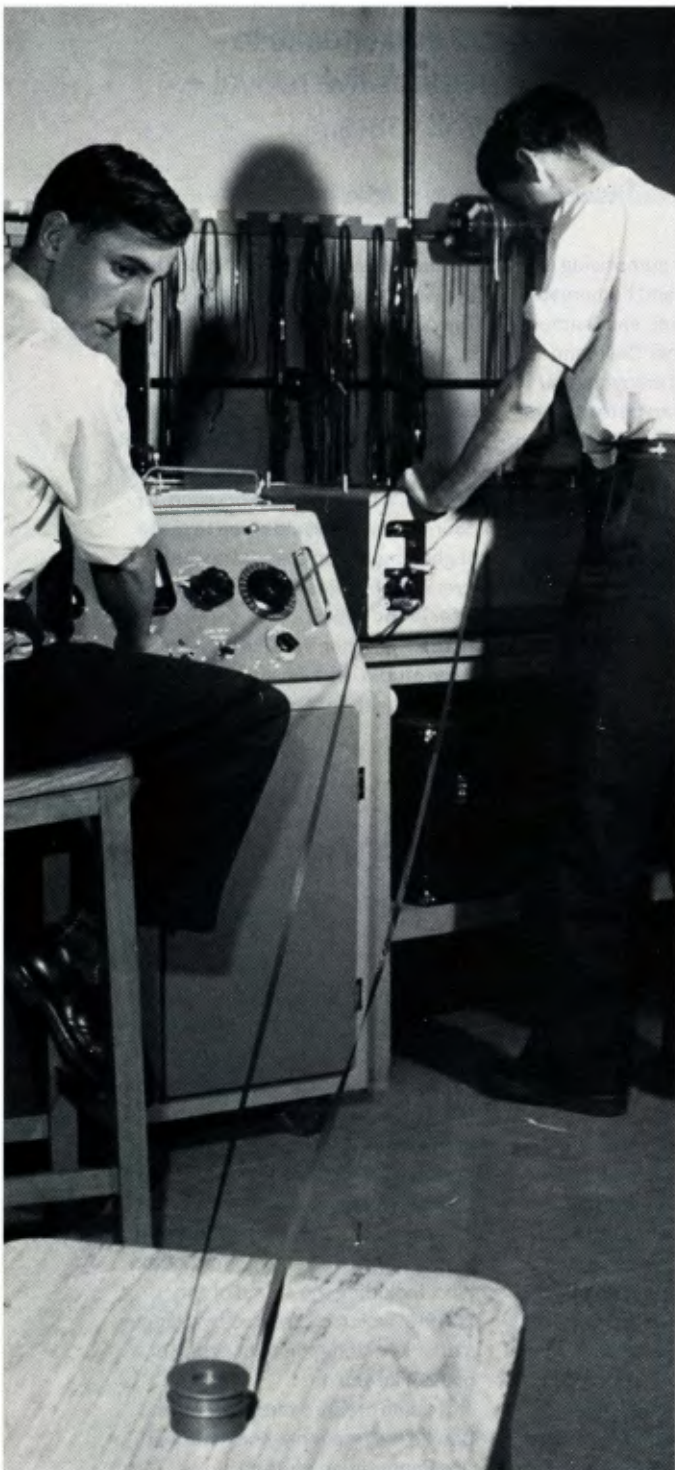
Brian Hodgson is best known for creating the hugely memorable and pioneering sound effects for *Doctor Who*, including the sound of the TARDIS, which he created by dragging a door key along the bass string of a piano, like you do.

He also created the voices of the Daleks, using a more conventional ring-modulation method. →

→ WHO DID WHAT?

Yet it's the theme to the programme that's become the most iconic output of the Radiophonic Workshop. And that was down to Delia Derbyshire and her assistant Dick Mills, who electronically recreated a score by Ron Grainer. Grainer's original composition – written on one sheet of A4 paper – only comprised the bass line, lead line and suggestions for parts to sound like a 'cloud' or 'wind bubble'. He left the Workshop to get

BELOW: Extreme tape manipulation was key to creating the Workshop's sound effects in the pre-synthesiser era



on with it and effectively fill in the gaps in the piece, with what he knew would be a fairly out-there version of his theme – Derbyshire was already renowned for her visionary, leftfield productions. He was right, and no musicians – or even synthesisers – were used on the recording, just a bunch of test oscillators and the rest of the odd collection of gear that the Workshop had inherited at the time.

Grainer described the bassline as sounding like a guitar or bass bassoon

and checking where edits lined up and then they repeated the process until all three 'tracks' were in sync and in tune.

It was weeks of painstaking work but worth the effort. The resulting theme, of course, has been with us for the last six decades, in one form or another, recreated by many and influencing even more, and is easily the most memorable tune the Workshop created. And while it would then supply effects and music for

No musicians or synths were used on *Doctor Who* – just test oscillators and oddball gear

and the pair recreated it using two tracks on quarter-inch tape, recording and splicing it note by note. Derbyshire interpreted his 'cloud' description as being filtered white noise, while she used a 'Wobulator' – a metal box featuring a sine-wave oscillator that could be modulated – for the 'wind bubble'. The theme was created inch by inch, by chopping together notes, with the swoops at the start created on valve oscillators. Eventually, three separate parts of the song – the rhythm, the melody and what Mills would call 'the twiddly bits on top' – were placed on three tape machines and Mills and Derbyshire would hit the start button on all three at once. They identified wrong notes by unwinding the tape

many varied shows in the 60s, its oddball electronics were perfectly matched to sci-fi output, such as BBC's radio productions of *The War Of The Worlds* and *The Hobbit*.

TEAM CHANGE

Towards the end of the 60s and through the 70s, synths became more available, as did multitrack tape recording, and the Workshop team changed. Derbyshire herself left in 1973, and arguably became a little less experimental. That didn't diminish the output, though, as the 70s newcomers – including Malcolm Clarke, Paddy Kingsland, Roger Limb, Mark Ayres and Peter Howell – made use of equipment including Studer A80 and B62 recorders; EMS Synthi

Favourites And Wishes

MusicTech: What are your favourite pieces of studio gear?

Paddy Kingsland: I started using Apple Macs in the 90s and have stuck with them – currently a Mac Mini – plus, I monitor on British-made Expression speakers... I've had them for years.

Mark Ayres: The computer and the various control surfaces – Mackie Control, Novation SL – that allow me to work without touching it too much. Also my collection of synths and my old Studer A80 tape machine. It needs a lot of TLC these days, but there's nothing quite like putting a reel of tape on it and pressing play. I also like Logic Pro and Nuendo and the amazing plug-ins made by Waves and Izotope and Arturia's soft synths.

MT: What would you like to see developed in terms of music tech?

PK: A notation program which is a bit easier to learn. Sibelius is great, but a bit of a steep learning curve.

MA: I want inventors to keep inventing. I want to be surprised. People like Tim Exile are constantly coming up with intriguing bits of software, as are the big companies like Waves and the tiny one-man-shows like Valhalla. Hardware-synth design occasionally hits the doldrums, but then Korg come out with the (underrated) KingKORG, Arturia release the MatrixBrute and then there's Novation's very interesting-looking Peak on the horizon. There's also a great community building hacks and mods for classic synths.

100, VCS3 and ARP Odyssey synths; EMT Stereo Echo Plate and Countryman Phaser effects and a Glen Sound mixer.

The team's output included more sci-fi – *The Changes* and *The Hitchhiker's Guide To The Galaxy*, to name but two – but also more conventional BBC documentary and show themes. Indeed, 300 productions benefited from the Workshop touch in that decade – everything from incidental sound effects to full scores. Elizabeth Parker joined at the end of the 70s and wrote the theme to another BBC sci-fi series, *Blake's 7*, and notably the David Attenborough series *The Living Planet*. By this time, the Workshop had totally moved away from its experimental start, justifying its existence by producing high-quality soundtracks for BBC output.

During the 80s, the Workshop kept ahead of the technology by upping its multitrack count and receiving investment in order to investigate sampling and computers. Early Macs were used alongside Fairlight samplers (more than £30k a pop at the time) and the Workshop continued to soundtrack the era. "It grew to become home to six full-time composers, each with their own room", archivist Mark Ayres told the BBC's own website last year. "According to Yamaha UK's

marketing director, at one point, it was 'the most up-to-date MIDI studio in the world'."

However, the technology that helped create the Workshop sound would arguably help undo it. Throughout the 90s, production tech was becoming accessible to everyone, and more composers had the power to compete. "[BBC director general] John Birt introduced a scheme called Producer Choice which was supposed to make the BBC more accountable and more cost-effective," says Ayres. "It meant that every department had to put a price on its services, but it was a false economy. The Radiophonic Workshop... could never compete on cost terms with freelance composers with similar equipment in their spare bedrooms. Eventually, the Workshop had to close."

In 1998, 40 years after its start, the Radiophonic Workshop shut its doors. Its impact on music production was second to none, though. Members of Pink Floyd, The Rolling Stones and Roxy Music visited it during the 60s and used what they learnt to great effect. Later electronic-music composers have cited the techniques and output as a huge influence – *Orbital* even famously covered the *Doctor Who* theme, and the two acts have performed live

together. Its legacy lives on, then, and Ayres is desperately trying to archive all of the material that it produced. "I started a digitisation programme, but it needs a lot of investment to do it properly," he said to bbc.co.uk last year. "It's nearly 4,000 analogue tapes and they won't last for ever. The National Sound Archive reckon we have about 10 years to save all this material – either it will have disintegrated beyond saving, or the equipment to reliably play it will no longer exist."

NEW PHONICS

But while Mark Ayres attempts to save the original work, he is also helping to resurrect its sound. In 2009, he teamed up with four other former Workshop employees – Peter Howell, Roger Limb, Dick Mills and Paddy Kingsland – for a live concert in London and the group have been performing around the country ever since with former Prodigy live drummer Kieron Pepper.

In the exclusive interview over the following pages, we catch up with Paddy and Mark to find out more about their memories of the Workshop, their current live show and even unearth details about some brand-new Radiophonic music... →

"For me the difference the pucks made on my console was most noticeable in the lower mids, tighter and more focused..."

Enzo Townsend
Award Winning Producer
& Recording Engineer



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ABOVE: By the 1980s, the Radiophonic Workshop was an early adopter of emerging technology, such as Macs and the Fairlight CMI

→ **MusicTech:** The Radiophonic Workshop was decommissioned nearly 20 years ago. What brought you back together?

Paddy Kingsland: We'd previously returned to save the Radiophonic Workshop's library from being thrown out by the Beeb, but got together properly in 2009 to do the Roundhouse concert, which proved we could do a live show. We'd never been a band, working as we did in isolation, on individual projects.

Mark Ayres really made that first gig possible with his musical contribution, combined with an amazing grasp of the technicalities of putting on a show. He is also very knowledgeable about *Doctor Who* and what those particular...*Who* fans want to see and hear.

Mark Ayres: I'd been tasked with acting as archivist for the BBC Radiophonic Workshop (something I still do to this day) and in 2001, we were asked by two visual artists to contribute a soundtrack to an hour-long event held in deepest Oxfordshire, called 'Generic Sci-Fi Quarry'. Peter, Paddy, Brian and I collaborated on it.

We'd hoped to involve Delia Derbyshire, and she and I had some discussion about it, but then she was taken ill and sadly passed away. We dedicated the soundtrack to her. After that, we thought there was mileage in more work together, but it wasn't until 2009 that we put on a big concert at The Roundhouse to celebrate (a bit late!) the Workshop's 50th birthday.

By this time, we'd released a number of archive compilations through BBC Music and Mute Records, so we knew there was interest.

Radiophonic On Tour

MusicTech: Tell us about the challenges of taking the music on the road for the tour. It looks like you each have a lot of tech on stage?

Paddy Kingsland: Yes, and the gear is pretty heavy, but the show depends on those old creaky synths and people like to see them.

Mark Ayres: We try to recreate the Workshop on stage. Everything, from tape machines and lampshades, original analogue synths to the latest in computer technology. It's not a cheap show to tour. We could do the entire thing on a couple of laptops, but although that would be a lot

simpler, it would have no visual spectacle, it would be terribly safe.

MT: How was each piece performed?

MA: Some are live. Others have sequenced elements and playback effects coming off a Logic Pro timeline. We have to do the *Doctor Who* theme, but we can't expect the audience to sit there for three weeks while we put it together. So there's an element of 'here's something we made earlier', but with added elements that change all the time. We also have as large an HD screen as venues can provide. We mix everything to a small number of groups onstage, via the X32 and a Mac running MainStage.

MT: You were pioneers of music technology and sound design. How did that feel at the time?

PK: I came to RWS in 1970, by which time, tape manipulation of found sounds was giving way to synthesisers to produce sounds. It was easier to produce tracks more quickly, although not necessarily better. Some of the 'old guard' were sceptical about the new equipment and the youngsters who worked out how to use it quite fast. We were keen and eager to make our mark, and probably irritating to them after years of working at a more leisurely pace, but most of them were very generous in helping us get started.

MA: I don't think anyone felt anything about it at the time, though I came in a bit later. At the time, you just do it and make the best of what you've got. It's only with the benefit of hindsight you see that there was actually pioneering, and enormously influential, work taking place.



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MT: What are your fondest memories of working there?

PK: Mine is that these were not only work colleagues but friends, some of whom are sadly no longer with us. Delia, Brian and John were still there and I learned a lot from them, not only about sound, but in the approach to taking briefs and dealing with producers. Desmond Briscoe, the head of RWS, was amazing. He'd worked on the classic radio dramas and started the RWS with Daphne Oram. He gave us the freedom to take risks and fail (not all the time!) and always backed us up if there problems with producers.

MA: I started in the late 1970s, having been massively influenced by the Workshop. I came in as sequencers started to appear on the BBC Micro, and the Fairlight was unleashed. It was another of many New Dawns!

MT: What do you think about the way that the Radiophonic sound has influenced so many people?

PK: It surprises me, of course, but don't forget that the credit is not all ours – because so many others were using electronic sound then, not least George Martin. But there's a generation in the 70s that was exposed to the radio and TV where we were heavily featured. We had everything, from weird sounds to chirpy cheesy tunes, but always using interesting and original timbres. Remember that before then, much of the music for those broadcasts featured semi-operatic performances of *Ride A Cock Horse*...-type numbers to a piano accompaniment. The contrast must have seemed like going from Eurovision to punk. I think the new sound colours made an impression on those young pupils, which they still remember with fondness. I feel honoured by that, but acutely aware that I was just lucky to be there at the right time.

MA: I think it's great. For people of my generation (which includes the likes of Aphex Twin and Orbital), we were brought up with the Radiophonic Workshop as the constant soundtrack to our lives. Whether it was *Doctor Who* on Saturday night, *Bleep And Booster on Blue Peter* in the week, or *Music & Movement* on BBC Schools Radio in the classroom, we absorbed it by osmosis.

MT: And of course, many of the compositions still sound as fresh today as they did when you produced them...

PK: We were ahead of the game, at least in terms of the timbres we were using, and lots of people still use those today – therefore, our old stuff still sounds (relatively!) cool in that respect. The recording quality hasn't altered so much as in previous years, so that helps, too.

MA: So many of the techniques were so fleeting. Pure tape techniques lasted about 15 years. Pure analogue synthesis about five. They still sound alien. The *Doctor Who* theme sounds grown rather than performed, because that's exactly what it was. Every note and every beat a separate snippet of recording tape, measured, cut and spliced. It's manual sequencing. It's not tight – it's loose and it flows and subtly syncopates in a way that is only possible with analogue, hand-cut tolerances. That was three weeks' manual labour for two people to create a two minute, 20 second master. There's love in it, and you can hear it.

MT: And that theme will always be associated with the Workshop, naturally...

PK: Well, unlike Dr Dick Mills, I didn't contribute to that, but just getting the tape out of the box and making a →

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ABOVE: Dick Mills, who helped record the original *Doctor Who* theme, rehearsing with the Radiophonic Workshop

copy to send off to Television Centre at the beginning of a new series was somehow a thrill, because there aren't many things that are so well known to everyone on the planet. It's a bit like looking at a famous work of art in a gallery. I did attempt to help Delia make a new version at some point, but it never made it to the airwaves, and rightly so. Her original was a brilliant piece of work.

MA: I was two when *Doctor Who* started. It's part of my life, though it wasn't until I was 11 that it became a bit of an obsession – and that was largely because of the way it sounded! In the late 1980s, I was commissioned to compose music for it for a couple of years and became a member of that privileged club. It's a brilliant thing to have been involved with.

OLD TECH TO NEW

MT: What do you make of the advances in music production technology over the last 20 years – well over the last 60 years, for that matter?

PK: I love all of it – it allows everyone to make music in a way that wasn't possible before. Some things require a steep learning curve – have you tried programming sounds on a DX7? But then have you tried playing a tune on a theremin? I still walk into a studio and play for hours, even without a project.

MA: Like everything else – fantastic, though sometimes a bit dangerous! Nowadays, almost anything is possible. This is both good, and bad. You need limitations, or you'll never get anything done.

MT: What do you think has been the most significant technological advance in that time?

PK: I have no hesitation in saying multitrack tape machines, followed closely by DAWs. They enabled

effortless layering of musical ideas, and when real effort is put in, the results are stunning.

MA: The tape recorder, for a start. It allowed sound to be captured, manipulated and changed, worked with like audible clay. Then the multitrack tape recorder, voltage-controlled synthesis, the digital sampler and sequencer and the computer workstation.

MT: What do you think of software virtual instruments and their ability to mimic the hardware you used?

PK: Very convincing. I've used the Arturia Jup-8V and am really happy with the results. My only difficulty is in operating such a small-sized instrument, but that's the nature of the beast and it is a lot lighter to carry!

MA: Some of them are great... though I always prefer to use the original hardware if possible – the knobs are fun and the original hardware Korg MS-20 does not have zipper noise when you do a filter sweep. Give me a true analogue hardware synth, any time.

MT: What are your thoughts regarding the computer itself as the central component to most modern studios?

PK: Again, I love it. It's convenient and it works. I spent years lining up tape machines and listening to hiss. I had to bake my master tapes from the 80s because the tapes deteriorated. I don't think discs sound 'better', although they sound lovely in a nostalgic way. I love the crackle which precedes an old film on a projector and the wonderful sound of optical recording. But I don't want to go back to wrestling with all that – I'd rather use a plug-in and put my energy into the music.

MT: You were pioneers of sound design, whereas today's composer has access to a billion different sounds and →

RWS Stage Gear

MARK AYRES

Roland JX-10, JX-3P, Arturia MatrixBrute and Korg MS-20 synths; Yamaha WX11 wind instrument; Novation SL25 MkII controller; Keith McMillen Qunexus; MacBook Pro running Logic Pro X and Steinberg Nuendo; MOTU 828Mk3 interface; Behringer X32 mixer

PETER HOWELL

Yamaha DX7 MkII; Novation SL25 MkII controller; AKAI EWI wind controller; Roland VG-99 guitar modeller and MIDI controller; Ibanez guitar with MIDI bridge; MacBook Pro and MainStage

PADDY KINGSLAND

Roland Jupiter-8; AKAI Advance 61 keyboard; MacBook running Pro Tools; MOTU 1248 interface; Arturia soft synths; Autoharp; Moog Theremin; Peavey guitar and Vox AC15

ROGER LIMB

Korg Kronos and KingKORG synths; U-Bass

KIERON PEPPER

Tama Superstar Classic drumkit; Roland SPD-S; Korg Microsampler; Novation Bass Station synth; washing-machine panel and violin bow

OTHER EQUIPMENT

Tascam 32 and 34; Roland D-50 and System-100M; Korg MS-50; Korg Monotribe; Korg Kaoss Pad; Yamaha DX7; toy piano



ABOVE: Rehearsing and recording at Real World Studios



LEFT: Peter Howell and Mark Ayres checking levels

→ **thousands of ways of manipulating it. What are your thoughts on this?**

PK: You have to restrict yourself one way or another. Brian Hodgson used to say 'a hanging focuses the mind wonderfully'. He was referring to the deadlines which always hung over us at the RWS. They were a blessing, because they made you get on with making music without agonising over sounds. The tools are still just tools and the important thing is achieving the effect you have in mind.

MA: It's always better when you're trying to get something interesting out of the technology, rather than just pressing a button, or scrolling through thousands of presets until you find the one that fits. Before all this, you made a sound that worked, and it was (by definition) original. It was also, quite often, quicker. I hear the same sounds on everything these days, and that is a shame.

MT: Has technology has made music production too easy?

PK: No – do you want to go to work in a horse and cart? There will always be people with great musical ideas and the easier the gear is to operate, the more productive they will be. But so many more people are now able to make music, which is a good thing in my view. They may never release anything, but they have had the same thrill in just doing it as the professionals have.

THE NEW ALBUM

MT: When you got together for the making of the new album, *Burials In Several Earths*, what was the original concept about?

PK: We set up our gear and just played with no particular aims, just to make sounds together and react to each other. A sort of electronic version of what jazz players do, but without a standard tune as a starting point. We made it up as we went along. Then the huge job of putting it together began, selecting the good bits, mixing and treating the sounds and putting it all together. This was done by Mark, with his usual brilliant attention to detail.

MA: Now, this is the thing. There was no concept. It was suggested we do a session with Martyn Ware and Steve Dub, and we all went into it with no pre-conceptions or real idea of what to do. Then, at the end of the day, we had enough material for a double album. Basically, we filled a room with analogue synths, a guitar, theremin, autoharp and piano (but no sequencers), then looked at one another blankly. Then one of us started noodling, and another joined in, and I looked at Patrick Collier through the glass and said: 'Start recording.' We carried on, stopped when we got bored, had a cup of tea, started again... It was all totally unplanned, totally organic, completely improvised, and utterly surprising to all of us. That happens very rarely.

MT: What do you have planned for the future?

I'm 70, so hopefully, I'll wake up tomorrow and finish a track I'm working on for a similar album to *Burials...*, in the sense that we recorded it in the same way. This time, we worked with Tom Middleton. Watch this space!

MA: We have enough material already for heaven-knows-how-many other albums, if we can only knock it all into sensible shape! **MT**