Volume 3

Artist fellowship, EarthArt initiative, 2016
University of Bristol, School of Earth Sciences

Is it magma?

Jo Lathwood

KILN TEST #3.

21st Dec 2016.

Outside temp: 9°C. grey skys wet underfoot but not raining.

n/b no pyroreter so estimate temps. mould place on top of fire bricks.

KILN ON @ 12:00. @ 100%.

 → inserted with pre cooked glass.

@ 13:15 moisture gone. blocked exhust.

@ 15:30 Kiln off.

Results: melted but sigs of shapes not fully melted.
mould is not glassy. able to get hole square out.
opened kiln @ 14:00 next day. n/b mould ~~sat~~ set on fire bricks.
to raise mould to wear temperature is higher.

To clean up: dremeled off refractory (takes a while) very large bamount of bubble but seems quite strong.

Part One

Artist fellowship

Jo Lathwood

Jo Lathwood, *EarthArt* fellow at the University of Bristol in 2016, developed work from an on-going project, *isitmagma?* to explore different processes in order to cast molten rock.

Lathwood makes sculptures and large-scale installations which often respond to particular sites, events, materials or processes. Working with recycled timber, she has built a meandering staircase travelling across three stories to facilitate visitors touching the church roof. Experimenting with foundry technologies, she has developed a way of making homemade lava sculptures and through researching traditional techniques, she has made inks from Oak Galls. Recurring themes are transitions, journeys, viewpoints and illusions. Her practice is driven by a desire to describe an emotional state through a physical space or object and engage viewers through an associated narrative.

Her portfolio varies greatly in form, scale, context and method of production, encompassing: temporary and permanent public art, exhibitions curated for galleries and heritage sites (often as the outcome of an artist residency) and studio-based work.

Past exhibitions and commissions include: *Getting There,* solo exhibition at Fabrica, Brighton UK (2018); *Curious Formations*, Trust New Art commission at Biddulph Grange, Stoke on Trent, UK (2017); *Isitmagma?,* solo exhibition at Earth Gallery, University of Bristol, UK (2016); *A Solid Above*, dual exhibition with Solveig Settemsdal at Hardwick Gallery, University of Gloucester, UK (2016); Resident Artist at Hestercombe Gallery and Gardens, Somerset, UK (2015); Art, Cities & Landscapes, commission in Amiens, France (2013).

Lathwood was co-director of Ore and Ingot, an artist-led fine art bronze foundry in Bristol (2012-19). Lathwood's studio is based at Spike Island gallery, Bristol, UK.

Follow Jo Lathwood's practice online at www.jolathwood.co.uk

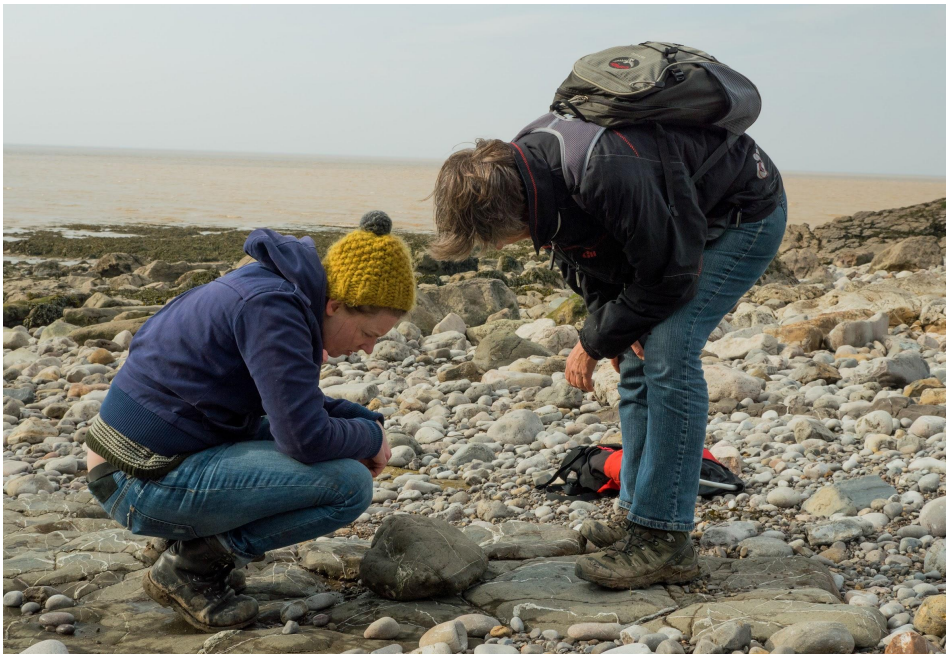
isitmagma?
Interview with artist Jo Lathwood

Could you tell us how the *EarthArt* fellowship began and how your conversation with the university developed?

I was developing a self-initiated project called 'isitmagma?', which explores different casting processes with molten rock (isitmagma.com). This led me to contact Jonathan Blundy, Professor of Petrology in the Department of Earth Sciences. Initially, it was a conversation by email which lead to some meetings at the university. He soon generously introduced me to and gave me access to meet other people within the Earth Sciences community, this led to an *EarthArt* fellowship in 2016.

After a period of time applying for project funding, I began working with Professor of Volcanology, Professor Kathy Cashman. The first investigative research we did together was a site visit to Sand Point, in Weston-Super-Mare, as I was interested in finding the most local point of igneous rock to Bristol.

Image credit, this page and double-page spread:
Professor Kathy Cashman and Jo Lathwood, site visit, Sand Point, Weston, UK, 2016.



Here, we walked around looking for lava pillows where I had permission to take samples to begin testing. I have a material-based practice, so I had a good understanding of how I could influence the material and potential avenues to go down but I didn't have the scientific knowledge behind what was happening. Therefore during the fellowship, when different outcomes or challenges would present themselves, Prof. Cashman was on-hand to answer why certain things were happening. As there are hundreds of different rock before I began melting it my first question was, which type of rock is the best to melt? Prof. Cashman recommended Basalt as it is common and has a low viscosity in comparison to other rocks, so would be easier to pour into moulds. We later tried to source that material locally.

- lava in its best state has a consistency of ketchup -

Melting the basalt involved heating rock samples up to 1260 degree celsius, which was possible with some of the furnaces I had access to. What I didn't expect was the viscosity of the material, as lava in its best state has a consistency of ketchup. Also, the process of cooling the rock down slowly became just as important as heating it as vitrification causes the rock sample to become brittle and unstable. Prof. Cashman and Prof. Blundy both helped by suggesting different chemicals that could enable the rock to flow better. Lithium tetraborate was the most successful.

You were really pushing the material. How did you work with the Earth Sciences department to achieve this?

I began working closely with the Practicals and Collections Manager Jonathan Hanson. He was really helpful due to the access he had to the workshops at the university. We took one of the most successful rocks that I managed to cast and cut it in half with a circular saw tool used to cut stone in the Will's Memorial department. This became entertaining as when I gave him the rock, he thought he would be able to cut it in half in a couple of minutes and then we could grab a cup of tea. However, after two and a half hours, the cast form was finally divided. <https://vimeo.com/339117675>. The result of this was a polished cross-section of a cast rock. From this, he made a thin-section slide sample, made to look at through a Petrographic microscope. This opened up a new work because the slide showed crystals were growing in the rock which is the definition of when a rock is a rock, having crystals. If it doesn't have crystals it is a glass. So, in regards to material status, it shifted from a

structurally complex old rock to a liquid, to ironically, a younger rock. I am sure the scientists would not use those definitions but that is how I was looking at its narrative.

- the slide showed crystals were growing in the rock which is the definition of when a rock is a rock -

How do you feel the work evolved and adapted through the conversations and support of the scientists?

I naturally began to look at the definitions scientists used with rocks within my practice. At the start, I was really interested in the quest of trying to melt and shape the rock from a sculptural point of view. By the end of the project, I was also interested in what the rock looks like under a microscope, how scientists define and research volcanos or igneous rock and how that then impacts on the climate or societal influences. I used these questions to look at how I could move the project forward.

Having explored the science behind the process and the conceptual journey of the work, could you share the making of the sculptural work and the final outcome?

The process of making the work was very experimental because all I was trying to do with my research was investigating how to use molten rock as a sculptural material. It was very formulaic; I was trying to cast a perfect sphere. When you are casting a sphere, as it has no points or extremities it cools equally and you are less likely to get problems with shrinkage or fractures. That was the first object I was trying to make. It also aesthetically relates to planetary shapes and is also a shape that you do not see recurring in the natural world - we see rounded objects but are unlikely to see perfect spheres. It was a natural form to be working on. Throughout testing, there were several failures which were important for the development of the project; around 90% of sculptures broke and 10% survived and lasted. The next step was to create a pattern or shape which involved casting a diamond shape which we later cut in half.

A lot of work happened off-site at Coles Casting in Dorset as I needed an experimental space to be able to make this kind of work. I was unsure what chemical reactions would happen in regards to fumes and how it would react with some of the moulds. We were effectively heating up the rock in a crucible inside a furnace and then pouring it into a pre-made mould. The best discovery was making a more unique mould base than I had made before. I was experimenting with lots of different refractory materials; refractory means a material that can deal with lots of heat. I have a good understanding of foundry techniques, so I was testing different techniques in sand casting and loss-wax casting.

This project was about the process of the whole story rather than just the final outcome. I exhibited pieces still in their moulds, things that had failed or things that had melted from rock in the kiln. The project wasn't about making a final work. In conclusion, the work had multiple outcomes;

- A live performance showing what molten rock looked like. This became an important part of the work. As well as learning how to shape the rock, I had also learnt how to melt the rock which in turn became a part of the project as a performative approach. Events were shared at Spike Island Open studios and later the Science Gallery in London. It has also been documented as a film.

- A film made by Paul Blakemore showing an overview of the whole process; from the raw material to an object. This was an accessible way to share the outcomes with a wide audience.

- An exhibition at the *EarthArt* Gallery in the School of Earth Sciences. This included two categories of sculptures;

  The 'mistakes' - these were unpolished sculptures to show why certain things happened and the science behind it. These might not be narrative or conceptual works but they were part of the puzzle, exploring the whole process.

  Final sculptures - nine simple polished forms, shown either set in plaster or on custom-made stands or shelves.

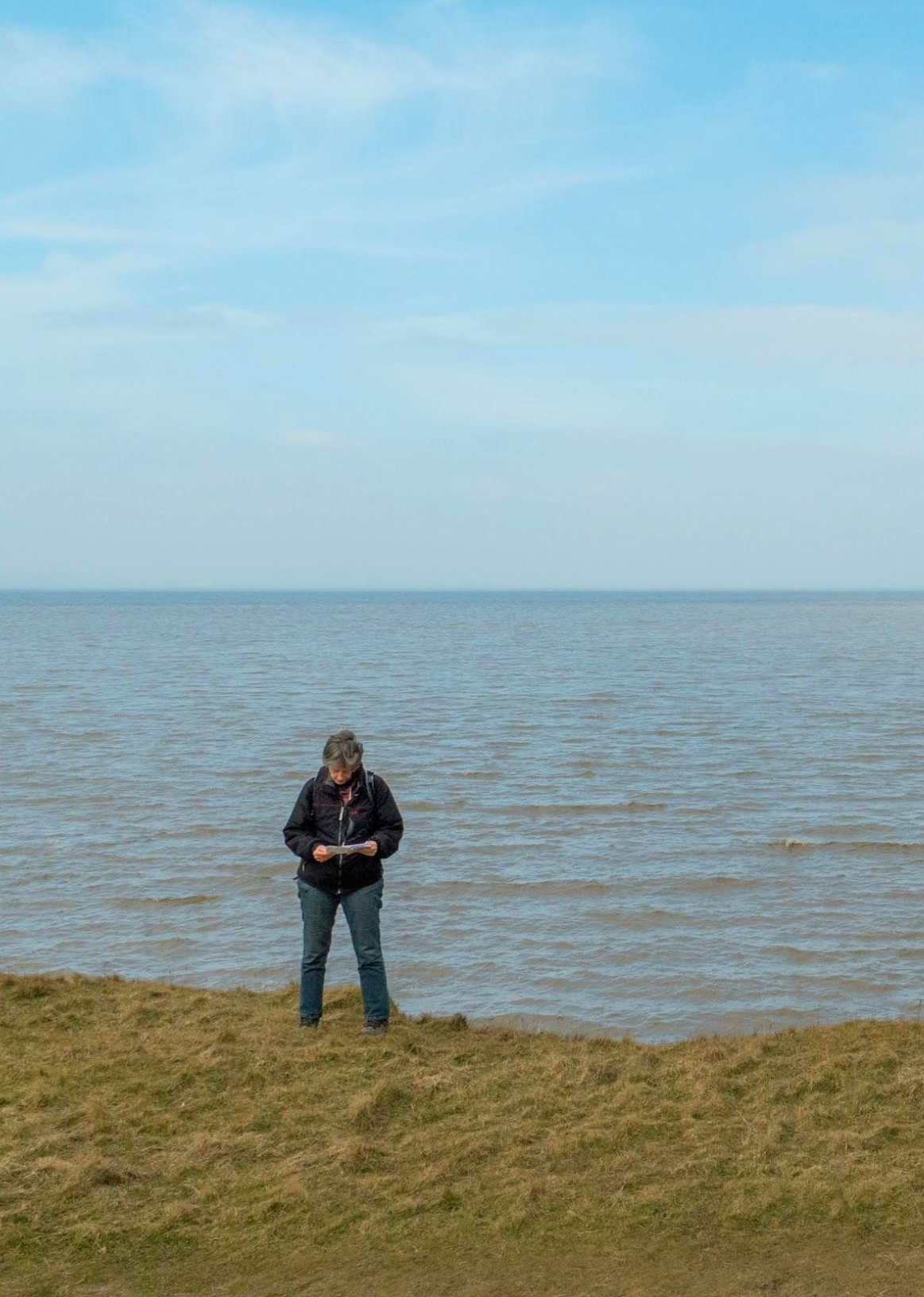
How did this project influence your work or lead onto your future projects?

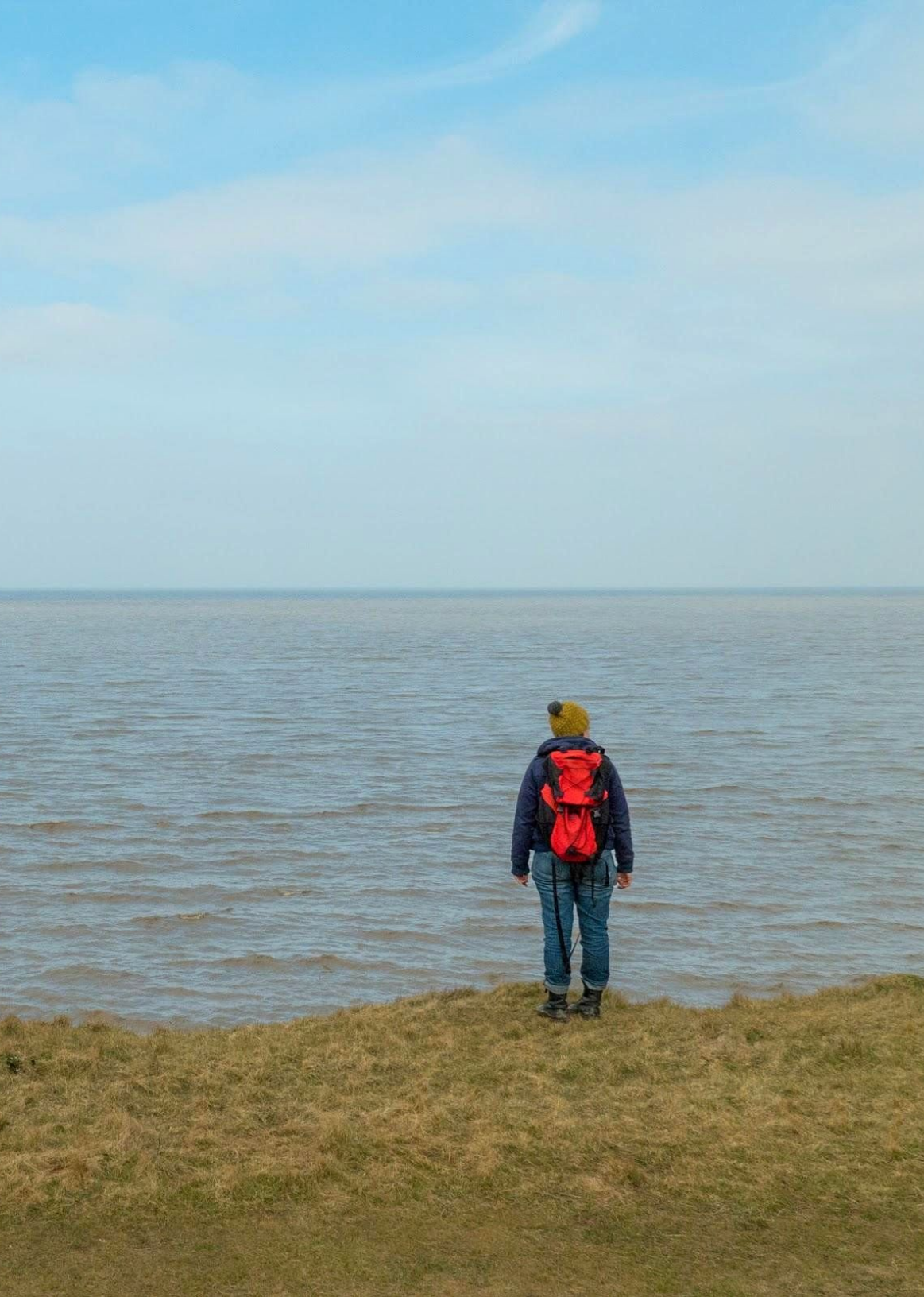
After the *isitmagma* project, I wanted to make some larger works so I applied for an outdoor commission at the National Trust property Biddulph Grange in Stoke-on-Trent, as part of the Trust New Art contemporary art programme. They had put a bid out for an artist to work with the on-site geological gallery. It was an interesting victorian mid-19th century gallery which was the original entrance to the garden. It was made by James Bateman. Bateman had two belief systems, which were common ideas at the time in the UK. Firstly, he was an Evangelist Christian and believed in the seven days of creation but he also believed in the discovery of geology, dinosaurs and fossils. He spent a lot of his time merging the two ideas. This was at the time when Darwin published 'Origin of Species', 1859. So Bateman made a Geological gallery that mapped the seven days of creation underneath a rock strata, that although was almost technically correct was not under the seven days of creation.

I got the bid, likely due to having had so much research with geology and my connection with the University of Bristol. I developed a new work sited at Biddulph Grange. The project was a year, with six months of research and six months of fabrication.

The work resulted in two 4-metre large physical structures feldspar (feldspar are crystals found in many of the rocks from the on-site gallery), that members of the public could walk into. Inside there are polarised filters on the windows, de-fracting the light to adapt the outside view of the world. Through my previous research of looking at Petrographic microscopes with the university, I was able to now explore the science behind how light bends and creates colours and also look at the crystallology of rock structures. I also performed another live lava-pour event as part of the commission. ■

Interview by Georgia Hall, February 2019





Part Two

Scientist contribution

Professor Jon Blundy

An Introduction to the fellowship

I met Jo through another *EarthArt* fellow, Rodney Harris. Jo was interested to build upon her experience of working with molten metals to explore molten rock as an artistic medium. Molten rocks are much more viscous than molten metal. Moreover, rocks melt over a temperature range, rather than a single melting point. This creates challenges for pouring and casting. Our scientists at the university supported Jo overcome this. We have a lot of experience of melting rocks in the laboratory, especially for understanding processes that occur beneath volcanoes. This is a field of study called 'experimental petrolog'. We introduced Jo to the idea of using fluxes to enhance melting at lower temperatures and to reduce melt viscosity. This greatly facilitates pouring into moulds.

Jo met with several members of the experimental petrology research group at the University of Bristol. The group leader, Professor Mike Walter, gave a short presentation, alongside Jo, at the launch of her *EarthArt* show. His presentation highlighted many of the technical challenges associated with melting rocks, serving as a nice counterpoint to Jo's challenges in producing the works of art on show. Various works of art produced by Jo in the course of her project where displayed in the School's Earth Gallery, where they could be examined by members of the School and public.

This was a wonderful example of how art and science share many challenges in the desire to better understand and represent the world around us. ■

Biography - Professor Jonathan Blundy is the Professorial Research Fellow in Petrology within the Volcano Petrology and Igneous Geology department of Earth Sciences at Bristol University. His research concerns the generation, movement and evolution of magma within the Earth. He uses a combination of igneous petrology, high temperature and pressure experimental geochemistry, thermodynamics and field geology to address the fundamental problem of how volcanoes work. He studied for a BA degree in Geology at University College, Oxford University (1983) and for a PhD in Earth Sciences at Trinity Hall, Cambridge University (1989). His PhD project, supervised by Professor Steve Sparks, concerned the Adamello granite batholith in the Italian Alps.

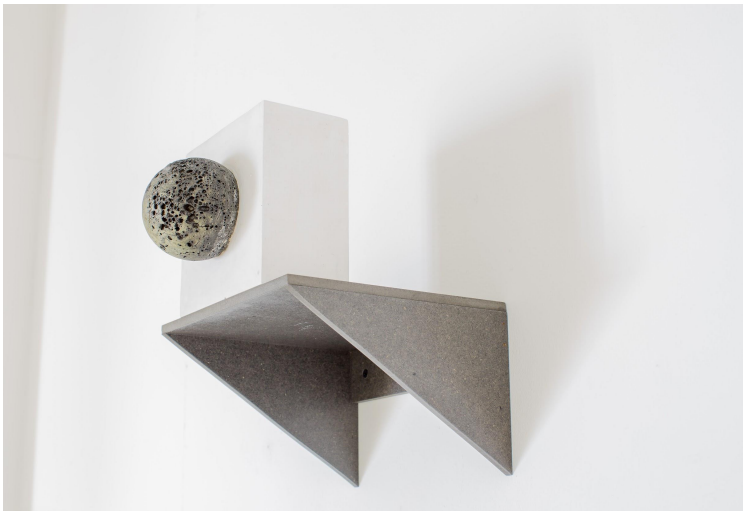
Professor Katharine Cashman

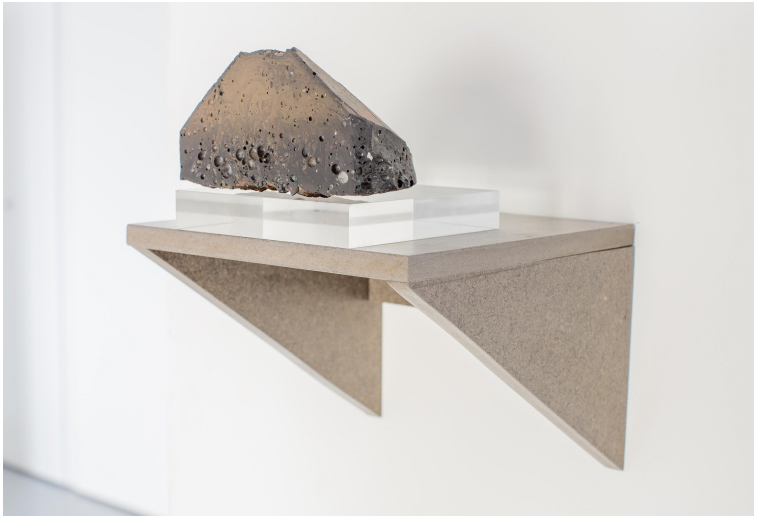
An art-science dialogue

A central component of geological studies is work 'in the field', which is where we observe, measure and sample rocks in the context of their surroundings. For this reason, one of Jo's first adventures with a scientist was a visit to Sand Bay, north of Weston-super-Mare, to see one of the best examples of volcanic rock close to Bristol. Here, on the southwest coast of the bay, is an outcrop of pillow basalt that represents minor subaqueous volcanic activity in the Arundian era of the Carboniferous (about 340 million years ago). How do we know this volcanic deposit formed in water? There are two obvious clues. Firstly, the basalt is found within the Birnbeck Limestone, which had to have formed underwater. The second clue lies in the pillowed description of the basalt. Pillow basalts form when lava flows slowly into water. The water rapidly cools and quenches the hot lava into a bulbous form as it advances. The lava, therefore, advances to create a mass of overlapping blobs, or pillows. There are great YouTube videos online!

There is another link between pillow basalts and *isitmagma?*: although near-spherical forms are unusual in deposits from active volcanoes, pillow basalts come close, and are mirrored in some of the forms that Jo cast. In this way, the pillow basalt outcrop can be viewed as part of the art-and-science dialogue, a dialogue that I not only enjoyed at the time but continued with Jo as she assembled her giant crystals for Biddulph Grange at the National Trust. I find that working with artists helps me to see my own field of study through a different lens, giving me a new appreciation for earth materials and for the forms they take. ■

Biography - Katharine Cashman is Professor of Volcanology at the University of Bristol who studies the physical and chemical processes that operate within magmatic systems. Prof. Cashman came to Bristol to study volcanic ash - its formation and ash properties that determine how it is transported in the atmosphere and how it is deposited on the landscape. She also has a long term interest in mafic volcanism, from channel development in Hawaiian lava flows to volcanic ash formation in eruptions from Hawaiian, Icelandic, Italian, Latin American and Pacific Northwest (US) volcanoes. Prof. Cashman holds a BA degree in Geology and Biology at Middlebury College, Vermont, USA (1976), which led to an MSci (1st class Hons) at Victoria University, Wellington (New Zealand) and a PhD in Earth Sciences at Johns Hopkins University, Maryland, USA (1986).



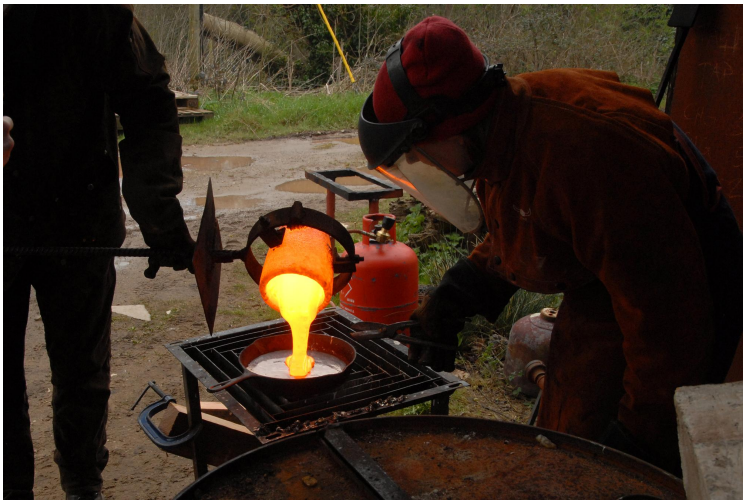


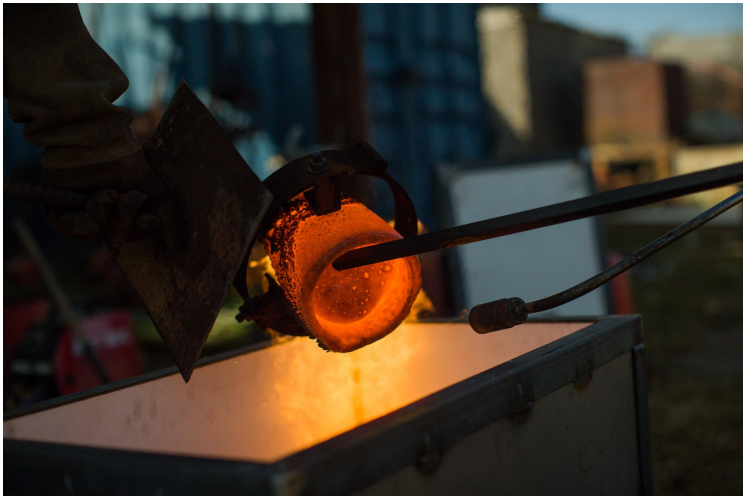
Credits

Top and middle left: ***Lunar***, Volcanic glass (Basalt), Plaster. 2016. Hand Cast Lava.

Middle right: **Mistake lava sculptures**, 2016.

Bottom: ***Tempered Chamber,*** Volcanic glass (Basalt), Acrylic glass. 2016. Hand Cast Lava.





Credits

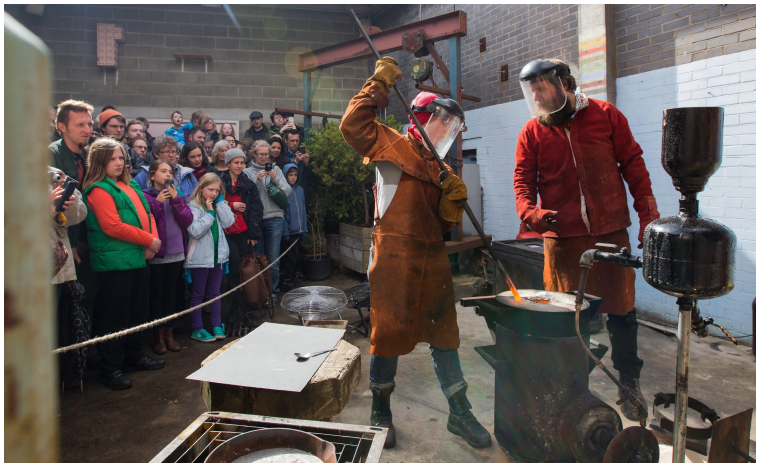
From top to bottom right:

Lava pour process, off-site in Dorset, UK.

Cooling lava in crucible. Off-site at Coles Casting in Dorset, UK.

Lava pour process. Off-site at Coles Casting in Dorset, UK.

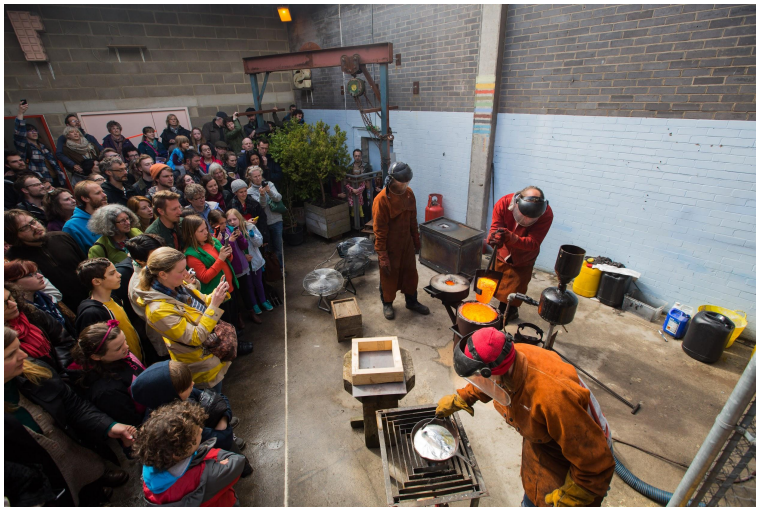
Viscous lava set into crucible after test pour. Off-site at Coles Casting in Dorset, UK.



Credits

Live performance of Lava Pour at Spike Open, Spike Island Gallery, Bristol, 2017.

ALL PHOTOGRAPHY BY PAUL BLAKEMORE



EarthArt Initiative

Founded in 2015, *EarthArt* is a series of collaborations between contemporary artists and scientists from the School of Earth Sciences at the University of Bristol. Each collaboration consists of a six-month artist Fellowship followed by an exhibition in the *EarthArt* Gallery in the Wills Memorial Building.

Earth Sciences encompasses not just rocks and fossils but increasingly climate change, oceanography, natural hazards, evolution and extraterrestrial life. There is a lot of material for artists to explore and we thought this was a great chance to bring artists into the School to meet with scientists and the wider academic community through a six-month duration Fellowship.

Jon Blundy, Professor of Petrology and *EarthArt* Co-Founder

The idea of developing the Fellowship and EarthArt Gallery at the University of Bristol following my Leverhulme Trust residency was to address two things; firstly, to deepen the dialogue and investigation between artists and Earth scientists, generating new ways of visualising research, and secondly, to create a Gallery to share this work with a wider public.

Rodney Harris, artist and *EarthArt* Co-Founder.

This booklet is an opportunity to reflect, share and document the fellowship and exhibition of artist Jo Lathwood in collaboration with the School of Earth Sciences at the University of Bristol.

EARTH GALLERY

University of BRISTOL

All photographs by Paul Blakemore, courtesy of the artist.

Many thanks to the artist Jo Lathwood and the scientists and academics from School of Earth Sciences at the University of Bristol, UK. With special thanks to Prof. Kathy Cashman, Prof. Jon Blundy, Prof. Mike Walter and Jonathan Hanson, previous Earth Sciences Practicals and Collections Manager who worked closely on this project. Many thanks to the EarthArt founders and Council members: Prof. Jon Bludy, Prof. Kathy Cashman, Claudia Hildebrandt, Jo Lathwood, Rodney Harris, Georgia Hall, Jenny Russell and Helena Moretti and gallery volunteers of the School of Earth Sciences.

Booklet interviews, research, text and design by Georgia Hall.

KILN TEST #4.

11/1/17.

cook for 5 hrs?

Outside temp. 9° sunny day.

Kiln on @ 11.10 @ 30% to cook out moisture. - empty mould.

mini causeway. one large mould placed on too very small thin ceramic blanet.

mould matter finely sieved.	glass ground/smashed down to fine powder.

@ 12.10 temp 75° cranked up to 100%.

@ 12.40 temp 150° still steam

@ 13.10 temp 150° still steaming switched off to cool to (inside wall 500°) in certain glass.

@ 13.30 restart with glass mould @ 70°C @ 100% kiln @ 280° C.

@ 14.30 temp @ 540° no steam / blocked exhust

@ 15.30 temp @ 620° at top + 490° at middle

@ 16.30 temp @ 875° at top + 695° at mid (orange looks melted

@ 17.30 temp @ 920 at top ~~870~~ at mid. (accidental left latch door open (☹))

@ 18.30 did not measure temp efficiatly. but switched kiln off. 5hrs total

P10