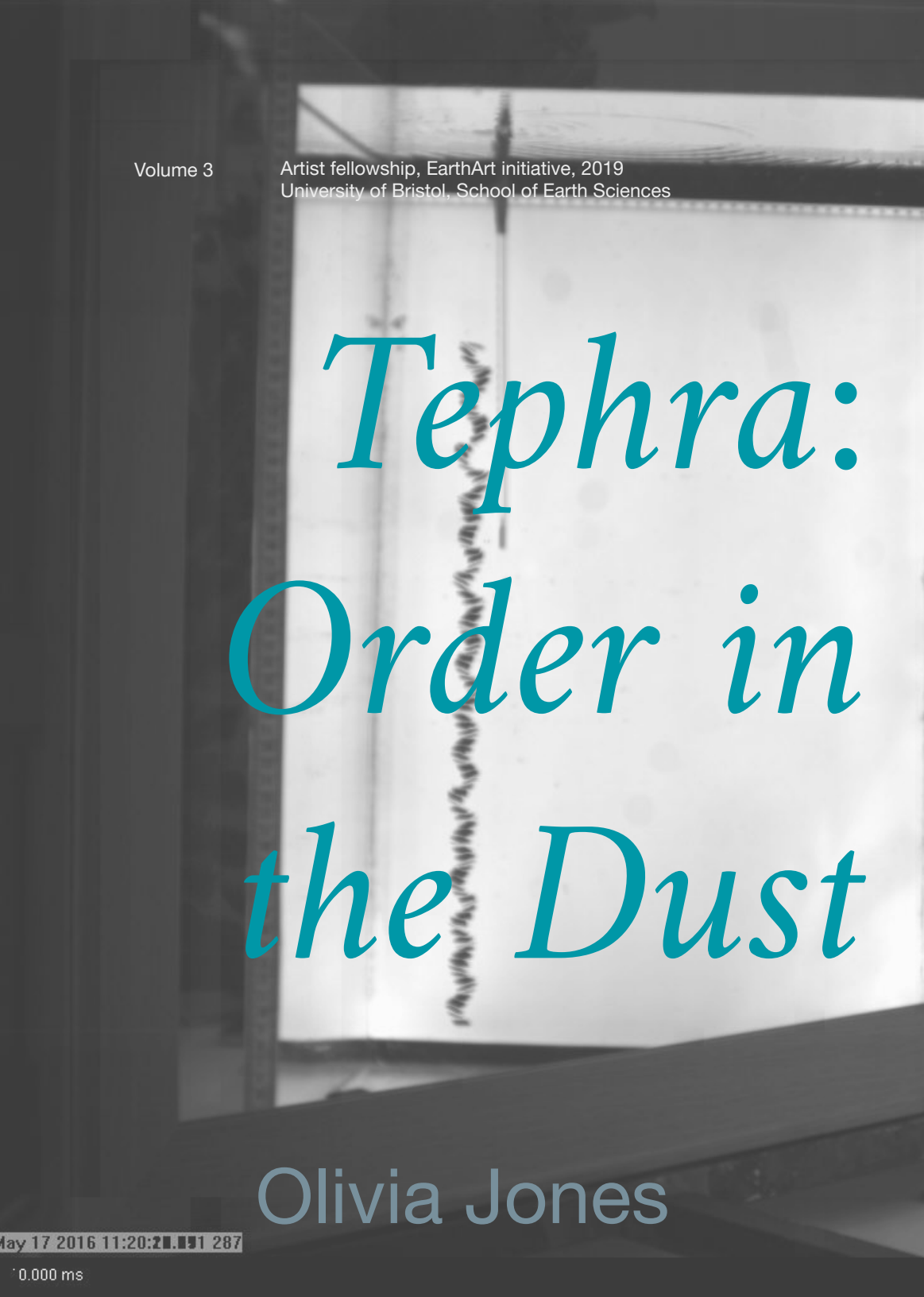

Volume 3

Artist fellowship, EarthArt initiative, 2019
University of Bristol, School of Earth Sciences

Tephra: Order in the Dust

Olivia Jones

Olivia Jones

Olivia Jones (b. London, 1988) is a visual artist based at Spike Island in Bristol and a member of Spike Print Studios. Working predominantly between sculptural and drawn processes, she creates works that explore the behavioural characteristics and structural potential of materials, objects and phenomena within landscapes.

Jones graduated with BA (Hons) Fine Art at Falmouth University (2013). She has shown her work in galleries across the UK and internationally. Projects include: Artist Fellowship, School of Earth Sciences, University of Bristol (2018-19); *Tephra: Order in the Dust*, Test Space, Bristol (2018); Artist in Residence, *Ashlantic*, Fur Island, Denmark (2017); *Contemporary British Drawing,* Xi'an Academy of Fine Arts, China (2015); *You Move Me,* Antlers Gallery, Bristol (2015); *Jerwood Drawing Prize*, London (2013).

During her *EarthArt* fellowship, Olivia worked with academics at The University of Bristol on the subject of ash analysis, building on a project she began developing in 2018 titled, *Tephra: Order in the Dust*. Exploring the behaviour and materiality of ash particles, clouds and plumes, Olivia intended to create a body of work in conversation with academics, looking into the methodologies, technologies and interface between science and art. Olivia produced two ceramic installations, *Dust* and *Gathering,* two screenprints, *Cascade* and the triptych *Outburst,* and a film entitled *Stuff.* The fellowship was made possible through a kind donation by Sarah Robinson, in memory of her late husband, artist David Robinson.

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EarthArt fellowship

Part One

An Introduction

to the work of Olivia Jones

The following text is a transcript adaption from Olivia Jones's talk at her exhibition opening at the EarthArt Gallery in the School of Earth Sciences, University of Bristol, January 2019. Edited 2020.

An Introduction
by Olivia Jones

Taking part in the *EarthArt* fellowship has been a really rewarding and insightful journey. The conversations between myself, Dr Matthew Watson, Reader in Natural Hazards at the School of Earth Sciences, and other academics in the department over the six month placement developed into interesting discussions around material journeys and memory.

As an introduction, I will give some context and lines of inquiry in my practice through discussing the body of work ***Tephra: Order in the Dust***, I was making when I began the fellowship.

I have always been interested in the landscape, our perceptions of landscape and how we read the structures within it. A lot of that influence comes from having a brother who is a volcanologist and coincidentally has a PhD from the University of Bristol. I was still at school learning how the Earth's surface pieced together when he was studying for his Geology degree. On walks he would describe how the landscape had been formed and the spatial depth of the land beneath our feet - it was very exciting.

In August 2017 we had the opportunity to work together and I travelled to Fur Island in Denmark to be resident artist of *Ashlantic*, a four year scientific research project led by the University of Oslo. The team there were analysing ash samples from volcanic activity dating back 56 million years and its correlation with historic climate change. On the edge of a large quarry the team worked with engineers to extract a borehole of material containing over 180 ash layers which would then be shipped back to Norway for analysis. The whole landscape was scanned, mapped, meticulously measured and annotated.

During the residency we began conversations about time, matter and patterns of nature, the cyclical events that morph the state of the planet and to which we are not immune. We discussed the evolving role of Earth Sciences in the modern political climate and the vital importance of understanding and connecting with our environment.

I came back to Bristol and created a film loop called ***Of the earth***, which was exhibited at Spike Island Open Studios with a text piece by the *Ashlantic* team explaining their research *(fig.1)*. In the title of the work 'of' expresses the relationship between a part and a whole and 'earth' (material not planet) is the substance of the land surface. The piece responded to the conversations and analysis of scale and time and visually translated as a flurry of rock and ash; 240,000 years of exposed material captured through the lens of a passing drone.

Around that time, the prints and drawings I was working on centred around creating forms in space; considering the forms as objects in space, how they were behaving, how they were weighted and what their action and intention could be. These forms had started to become reminiscent of cloud structures and ash plumes. Inspired by the *Ashlantic* project and the samples of volcanic ash I had brought back, I became interested in ash as a material, primarily ash clouds as substance suspended and the duality of the material as being both ominous and beautiful.

These early drawings developed into the series ***Tephra: Order in the Dust***. The body of work takes its inspiration from Italian writer Italo Calvino's, *The Complete Cosmicomics*, a series of short stories depicting the evolution of the universe and the birth of matter from the perspective of cellular bodies. There is a quote in one of the stories that really resonated with me; '*I play the game, in other words, the game of pretending there's an order in the dust, a regularity in the system, or an interpenetration of different systems, incongruous but still measurable, so that every graininess of disorder coincides with the faceting of an order which promptly crumbles'* (1969, p.182).

Reflecting on this passage in the books I developed my own set of unique characters in the form of cut out aquatint etchings whose shapes and forms derive from images of erupting tephra. Within the series I investigate the potential of the characters/etching plates using rhythms, cycles and changes of production to establish the consciousness and grammar of each form.

At Daybreak, shown in the *EarthArt* Gallery exhibition, is one of the earliest works in the series and it relates to the beginning of Cosmicomics *(fig.2)*.

The story begins with the essence of a family unit suspended in nothingness, they retain a memory of something but it is very intangible and then suddenly they are torn apart and thrown across the universe. In the digital print I have pulled and spliced one of the characters, rending its form, forcing it into separate parts.

I began to develop each of the characters, creating simple interactions by layering and multi-printing the copper plates. ***Eddy*** is an example of a print that I created through the process of printing one etching plate multiple times, each time moving it in a slow spiralling trajectory that layered into the print before it *(fig.3)*. New imagery started to reveal itself through this process, an ebb and flow of cloud forms. The unprinted section of the paper is painted in a deep black to create a void around the forms and give them a weightlessness so their momentum can be read in different ways.

'Ritual', from the series, developed as both a print and film *(fig.4)*. Based around a formation of a circle surrounding a central point, a ritualistic formation reveals itself through the production. The edges of each character are blurred and interwoven into the next as they weave around the central form. The smaller figures are reminiscent of people dancing around a fire, the black section at the base acting as a horizon line and grounding the figures in their idiosyncratic world. The development of ***Ritual*** into an animation became the next phase of the anthropic evolution of the forms, moving them into an animate stage and bringing alive their static dance.

This is where I was at when I applied for the fellowship. I had this line of investigation, of finding order in the dust, and a desire to learn more about volcanic ash as a material. It quickly became apparent that there was a wealth of knowledge on volcanic ash at the University of Bristol. It was a fantastic opportunity to work with volcanologists specialising in the material, to learn about the behaviour and materiality of ash particles, clouds and plumes, and to discover the technologies used by the scientists in their research.

A central figure in this collaboration was Dr Matthew Watson. We began our conversations in 2018, when Matt introduced me to his work on Fuego Volcano in Guatemala and the research taking place using drone captcher

technologies *(fig.a)*. Our discussions about volcanic ash quickly became focused on ideas of entropy and order, energies contained within systems and natural phenomena, and the perspectives revealed by new technologies. When referring back to the Cosmicomics quote, we discussed the potential meanings for the word ‘graininess’, to describe how granular a material is, but also as a reference to the scale and texture of disorder. Many conversations led back to the process in which things are made and destroyed, on cyclicity and order. ■

EarthArt fellowship by Olivia Jones

Part Two

Artworks made during the EarthArt fellowship

Continuation of a transcript adaption from Olivia Jones' talk at the opening of her exhibition at the EarthArt Gallery in the School of Earth Sciences at the University of Bristol, January 2019. Edited 2020.

DUST *(figure 9)*

At an early stage in the fellowship, I spoke to Prof. Kathy Cashman about her work with volcanic ash and she shared with me images of Ash particles taken through a microscope *(fig.b)*. Information within the shapes of the ash particles tell us how they behaved in the atmosphere, there is so much memory contained in these forms. Looking at this, I began experimenting with clay in the studio, thinking about the instantaneousness of the creation of the particles and the action of the volcano as it produces material. As a result, I made the exhibited ceramic work called ***Dust***. In order to make this work, I began with a large bag of clay, I pulled out pieces rapidly thinking about the set of conditions I was applying to the material: the amount of clay I can pull with my hand, between my thumb and forefingers, and the quick action contained in the setting of the clay. As I started to make the pieces, echoes in the material began to build up, shapes started to repeat themselves. There is a certain clarity when objects are created in multiples because you can see individual characteristics more clearly when there is more to compare against. I titled the work *Dust* referencing particles settling and matter lying on surfaces or being carried through the air. Dust is also a nod to the Philip Pullman books *His Dark Materials* that I loved growing up - Dust as a conscious material holding memories.

Around the time of making ***Dust*** *(fig 9, p.21)*, I was given some ash by Matt from Pacaya Volcano in Guatemala, collected from the top of a hotel roof after an eruption. When I looked at the particles under the lense in the lab (fig.c, p.22, 24), I noted how they looked remarkably like the shapes I'd created for '*Dust'*. So, I worked back into the ceramics with a black glaze to match the tones of the ash under the lense. Painting them was a much slower process. Through painting them I found out more information about them and their formation, such as, how the material had folded and hardened and where the pressure on the clay had left the impressions of my fingerprints.

STUFF *(figure 5)*

Once I'd begun collecting ash samples I was keen to acquire more to compare against the material I already had. I sent an email part way through the fellowship asking if anyone would be interested in sharing their research and materials with me. I had lots of fast replies and many scientists were really enthusiastic to share what they were doing and talk about their work. Hannah Buckland was one of the scientists who replied and very kindly spoke to me about her work with Mazama Ash *(fig. d)*. This type of ash originates from the eruption of Crater Lake in Oregon, USA. Hannah uses sample mounts; a process where ash particles are set in resin and sanded back to give a really smooth layer to look at under a scanning electron microscope. Essentially, you are splicing the Ash particles on one plane to reveal the internal constructions *(fig.d)*. I found the images mesmerizing, especially when considering at what point you are cutting the particle and how different it might look if it were cut a few microns further away. I also used material and imagery from Fuego - images with material scales of 100 microns showing minute particles (*fig.e*). I was interested in the aerial view and the altered sense of scale this offered. Some of the smaller pieces really look like satellite imagery and I enjoyed the contrast of micro and macro elements.

My research into these sets of microscopic images developed into a film work called ***Stuff***. For this work I returned to the ash plume character forms created for the ***Tephra: Order in the Dust*** series and scaled down the shapes to match those of the ash particles under the S.E.M. The desire came from viewing the material fused in resin and wanted to unleash the particles back into a moving realm. I created a sequence of loops that the animated characters could flow round. The film has a clinical white background and each character moves independently across the screen. The characters never touch, some move slowly in a snaking pattern, others dart about in an erratic and charged manor. There is a certain sense of futility watching it, as the sequence repeats and the characters return to the beginning for another silent cycle. The film was screened in the *EarthArt* Gallery as part of the exhibition. Previously, it was shown at the *Test Space* Gallery in Spike Island (2018), displayed on a screen suspended from the ceiling to become part of the atmosphere of the space.

CASCADE *(figure 6)*

The print work ***'Cascade'*** takes us within the centre of an ash cloud and draws on a few different anecdotes and experiences from the fellowship. For example, the early videos Matt showed me of drones flying directly into ash clouds and the sensation of viewing all of the particles at close proximity. There is something about the videos, a certain quietness they have to them. Geologist Ailsa Naismith shared with me her experience of being near Fuego and how ash would fall silently around her and sometimes she'd not notice until there was a layer of black ash coating her skin. That really resonated with me in this work.

In one of our discussions, Matt told me about there being a possibility within ash clouds for a temporary alignment of particles, that within an ash cloud particles can align along a path of least resistance, creating moments of order within a chaotic system. I find when you see such pristine order within nature you really look for that human connection, it becomes too real, even though it exists within nature, such perfect order feels unnatural.

Finally, quite late into the residency, I was recommended to speak with scientist Jennifer Saxby about the photographs she was creating of ash-fall trajectories. Jennifer kindly shared images with me that are made by rapidly photographing different shapes of plastics that represent ash particles as they fall *(fig.f, cover image)*. These images became an influential reference and I followed a similar process in the creation of the work ***Cascade***.

In terms of my process, I was working with scanned photographic images of ash particles and began creating screen prints using the images, thinking about the falling particles and the rhythm and flow as they descend to the ground. It was exciting to see how within the prints it was possible to alter the behaviour of the particles and create patterns, however working with the photographic imagery felt too detached and I didn't feel connected to the work. So, I went back and began drawing the ash pieces. I created detailed drawings of individual ash particles in order to build up a worksheet of forms that I then used in the screen prints shown in the *EarthArt* exhibition. Looking more closely at the images, and spending time drawing them out, gave me time to think about the composition of the material and how different each

element was. The collection of drawings represent a diverse collection of ash from a number of different localities and time periods. Using an exposure unit in the print studios I transferred the images onto a screen (used for screen printing). All the particle drawings were spread out across the whole of the screen surface and created the basis for ***Cascade***. In a similar process to earlier works in the series I created ***Cascade*** using one image printed multiple times. Focusing on falling trajectories and building up a cloud system, I slowly moved the paper down and side to side after each print to create a falling trajectory for the drawn particles. The resulting image is of a vast black cloud, a torrent of particles cascading to the ground as a black carpet of material.

Within my practice I tend to title artworks after I've made them, trying to encapsulate what the work is doing, what its action is, what it is trying to communicate. Cascade can mean a few different things; to arrange something in sequence or series, a mass of something that falls or hangs in copious quantities or a large number, or amount of something occurring at the same time.

OUTBURST *(figure 7)*

The second series of prints made during my fellowship is titled ***Outburst***, a triptych of a sequential series of prints, portraying an explosive action and the creation of new material. To make the work, I gathered together the ash particle drawings used for ***Cascade***, cut out the individual pieces and blew them out onto the screen printing bed for exposure. I wanted to try and capture a sudden emission of energy and particles and also think about the vocal link to production. There are many written references in literature of *the fire in the mountain* and *the mountain having a breath*. I wanted to play with this idea within the production of the work. In order to capture this element, I exposed the image three times to show how the drawings of ash dispersed. Within the prints, the elements, the printed shapes, are exposed as they move further away from the source. Each of the three prints has a black base, a flat void that removes any reference to the scale of the explosive action. It's slightly alienating because of its rigid form, a sort of digital plateaux that grounds the action.

GATHERING *(figure 8)*

The other major work that I created during the fellowship is a series of ceramic sculptures. I wanted to push the ash material I had collected into a new phase and try and fire the ash in the kiln to create a glaze. Organic materials have been used in glazing and ceramics for centuries, including the uses of volcanic ash, notably used after the 1980 Mount St. Helens eruption in the US.

Results from early experiments were varied as initially I didn't take the kiln up to the right temperature and the ash would burn and fall off the clay. So, I went back and spoke to some knowledgeable people in the studio community who advised me on different material combinations to use in glazing and to create some test pots to try out different material ratio. If the test pots had the wrong consistency the glaze would fall into the centre of the pot and it wouldn't damage the kiln.

I made 30 small test pinch pots in total that were displayed in one of the vitrines in the *EarthArt* Gallery *(fig.8a)*. Having altered the process, I put the kiln temperature up to 1280 degrees which helped the material become glass-like. The two additional elements that I added to the glaze mix were feldspar and ball clay. I found that a higher ratio of felspar gave more of a sheen to the material and the more ball clay I used, the more matt the outcome would be.

I really want to learn more about why that happened and during the exhibition run I hope to bring someone knowledgeable about ceramics with a volcanologist to explain why particular things happened to certain materials.*

Once I had the glazes under control, I began thinking about the forms that I wanted to make. I wanted to expand on the process of the ***'Dust'*** installation (fig. 9, p.21) by extending the forms by giving them more capacity for expansion. So I began moulding the clay with two hands, working the material up until it broke free from me to create a form. I had to use a very rigorous numbering system throughout the making, glazing and firing stages to make sure I knew which ash was being used for which shape. I called the ceramic work ***Gathering*** *(fig.8)* because I really wanted to reflect the

community of people connected to the material. It is quite overwhelming coming into the department to realise how much work is being done there and how far-reaching each part of that work is in terms of time, location and societal impact. This was my opportunity to bring these elements together and show them in a work. I called the work ***Gathering*** to reference an assembly or a meeting; the act of gathering, to bring together and take in from scattered places or sources; and gathering, to pick something up. That is the start of the research, to gather the materials from the earth and to bring it into this environment to be analysed. As I found with ***Dust*** *(fig. 9, p.21),* the forms would take on their own unique characteristics, it was a joy to start to place the sculptures, to move and turn them and see how they interacted on their display shelf. The work is accompanied by a key system, a reference that connects each ash glaze back to their original location and the volcanologist who collected the material. The key system acknowledges who worked on the material and where it has come from, with the hope that it might spark some conversations when looking at the work.

At this point I finished the fellowship. My hope for the exhibition is that whilst the work was in the gallery space I can continue to develop the conversations I've had during my time at the University, because six months flies by and there were lots of people who supported me within the communities at the university, Spike Island studios, friends and artists that I feel should meet each other. I envisage the exhibition becoming a space to continue the conversation about the material of ash and the processes that people use. ■

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* Following this lecture the event '***Material Discussion***' took place discussing ceramics and glazing processes, at the Wills Memorial Building, University of Bristol on 24 May 2019. The event was led by artist Olivia Jones, ceramic specialist Oliver Kent and Professor Kathy Cashman. During the event, they discussed the behaviour of volcanic ash and the use of organic ashes in ceramics; how the composition and origin of the ash might affect the way it reacts and the ways in which materials in the local environment have been utilised and celebrated by artists over the centuries.

Q&A following the talk Olivia Jones and Dr Matthew Watson

Professor Jonathan Blundy: I really like what you said about Philip Pullman and how Dust holds memory. Interestingly, each of those little ash particles does hold memory, the memory of the magma underground, it could have been there for a very long time, it remembers coming out, being fragmented and cooling, releasing volatiles. They are all individuals with their stories to tell and I think that came out in the talk that we, as volcanologists, can see the story and the memory in that dust, that resonated with me.

Audience: I was really interested in what Matt said about the information and behaviour held in material and then Olivia talks about the quote in the Cosmicomics (p.4, 6, 28) series. What kind of conversations did you have about these elements?

Dr Matthew Watson (MW): That was probably the formative discussion we had about the interesting stories material tells. Memory is a really good way of constructing that idea in your mind because a Volcanologist would say they record the pressure, temperature and the forces applied to that rock. But we immediately spoke about the Cosmicomics which seemed to bridge what Olivia was already thinking about and the Volcanologists interpretation of particle history. It is also incredibly aesthetic.

Olivia Jones (OJ): Yes, Matt connected the quote from the book with an actual process that occurs with ash particles. It was great to link together our ideas and work.

Audience: I was interested in the order and random chance, as you seem to take great care in composing these images but it's always quite respectful of the wonder and the element of chance; tearing out the clay to form a piece or moving the print plate. Matt also showed images of the inscrutable process used in his work and the models used to understand material. I wonder if you both see chance and chaos differently in your work? Whether, Matthew as a scientist, you'd hope to be able to understand it all or whether you still appreciate the element that something might be impossible to get?

MW: As a scientist uncertainty is everywhere, particularly as a natural scientist who works outdoors. I always look at the people who work in the lab and think about how much control they have over their work. But there is something incredibly striking about some of the stratigraphy you see where you look back at the process and you think it's utterly chaotic but within the deposits you see such fine detail and structure.

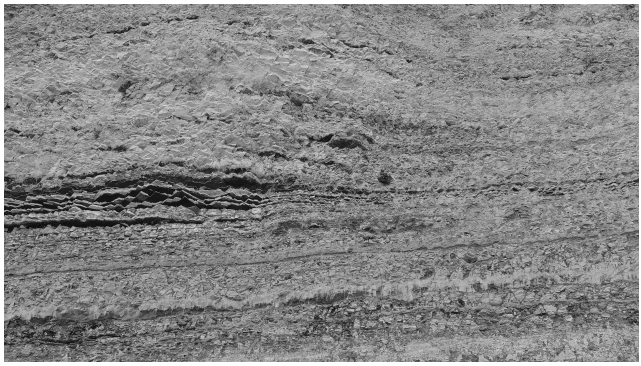
Geology is about taking complicated pieces of information and building together a story from it, particularly when you work in the field. The process of moving from chaos to something that's really very ordered is interesting and that was a backdrop to our early discussions (p.32).

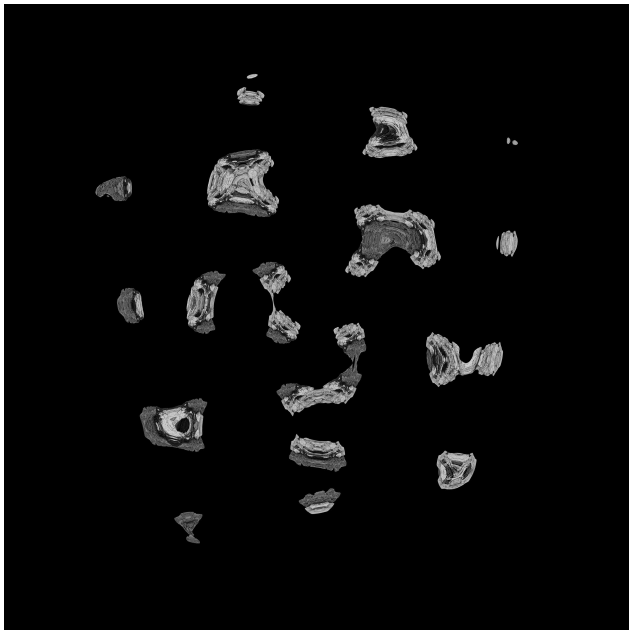
OJ: It's *order in the dust*. Chaos *can* be really beautiful, for me, definitely when making work, I like to always allow the material to reveal something to me because if it doesn't, I lose interest in it. The discussions that we've had about this, this idea of chaos, sometimes chaos and disorder can be a lot of very small, simple interactions but just built up into this huge cloud of events. Matt and I spoke about the experience of people being close to pyroclastic flows and the stories of being mesmerised by how much information the cloud is visually giving you as it comes down the mountain. When you do find a moment where everything is very aligned and ordered, that's when it becomes an unnerving thing, so sometimes chaos can be very beautiful.

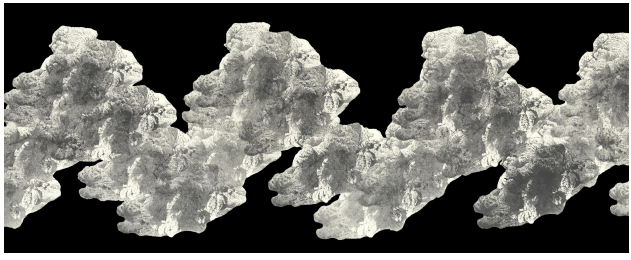
Artist and previous *EarthArt* fellow, Jo Lathwood: I am interested in the glazing process, it's so rewarding seeing how your research went from finding the material to putting the glaze on the sculptures. I am curious about how easy it would be to replicate the glazes that you've made. If you said*, 'I like this glaze and I'd like to work with it more',* does that mean that you could use the same sample, are they a one-off or are they replicable? Because I imagine the dust is full of hundreds of different things, glass as well as minerals. (ref. *Pinch pots*, fig.8a, p.12-13,20)

OJ: I believe the effect could be replicated as I recorded the ash, feldspar and ball clay ratios and quantities and have notes on the granularity of the material which affected the glaze outcome. Professor Steve Sparks from the university has a huge quantity of Montserrat ash which created a beautiful black glass. For that I used 100% ash mix and it had a stunning reaction. With some pieces I used small ash quantities and others I mixed different types from the same volcano, so I couldn't remake it accurately. I like that there is always a bit of a surprise in the materials reaction because each sample is unique. I'm not sure I'd want to recreate them exactly.

MW: They did seem to take on certain a personality. As someone who provided some of the samples, I would add that you can kind of pick yours out of the line up, even after they're glazed. In terms of replicability, the samples are probably quite homogenous. My thought is they're probably quite replicable. If you went to a volcano and sampled a different site you might get something different but if you're collecting a lot from one particular spot, you could subsample and they would be quite similar. It's interesting because that's part of the process that put them there. ■







Caption Index

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An Introduction

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Figure 2. *At Daybreak*, 2017. Digital print. Image courtesy of the artist.

Figure 3. *Eddy*, 2018. Copper aquatint etching and gouache. Image courtesy of the artist.

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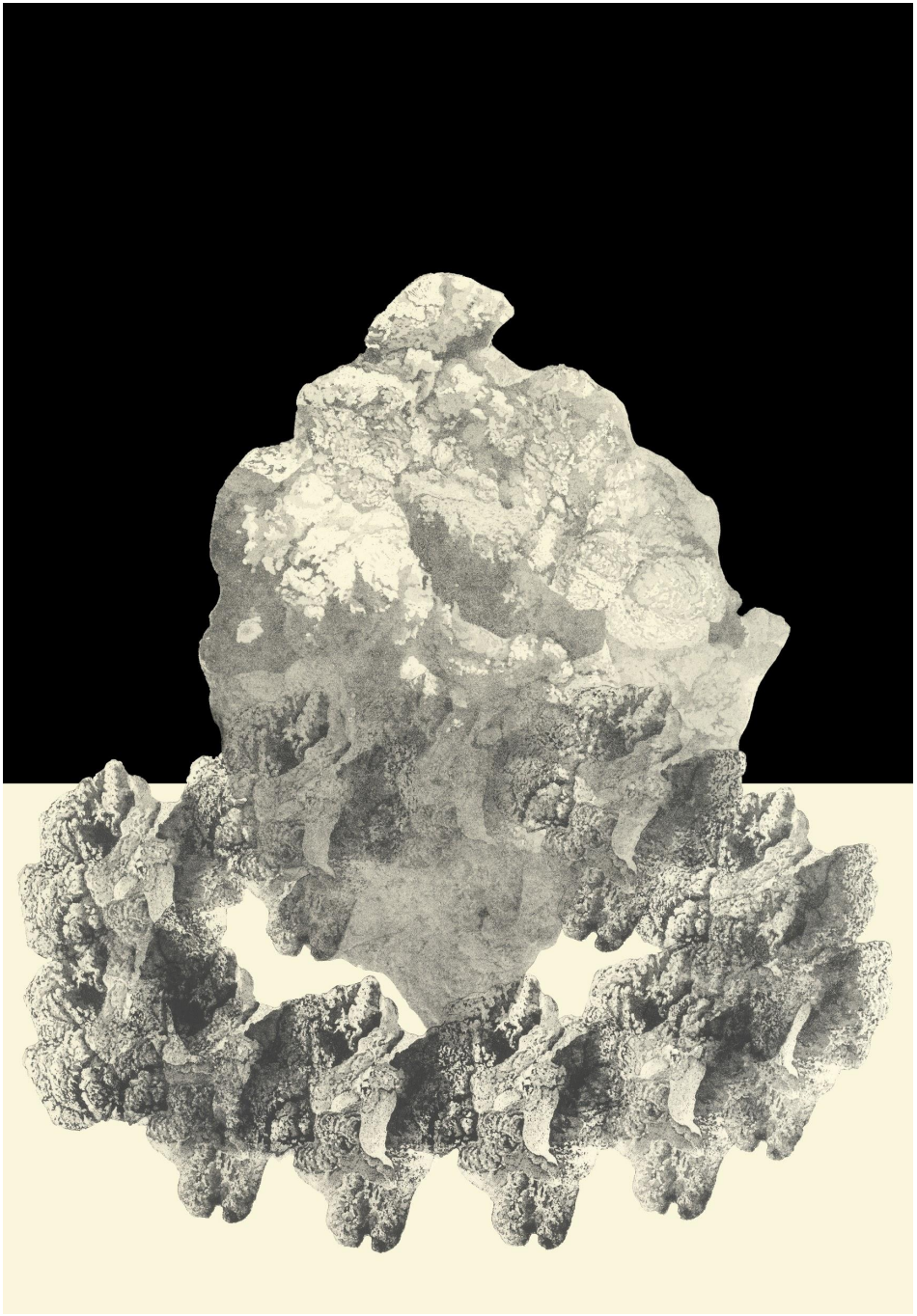
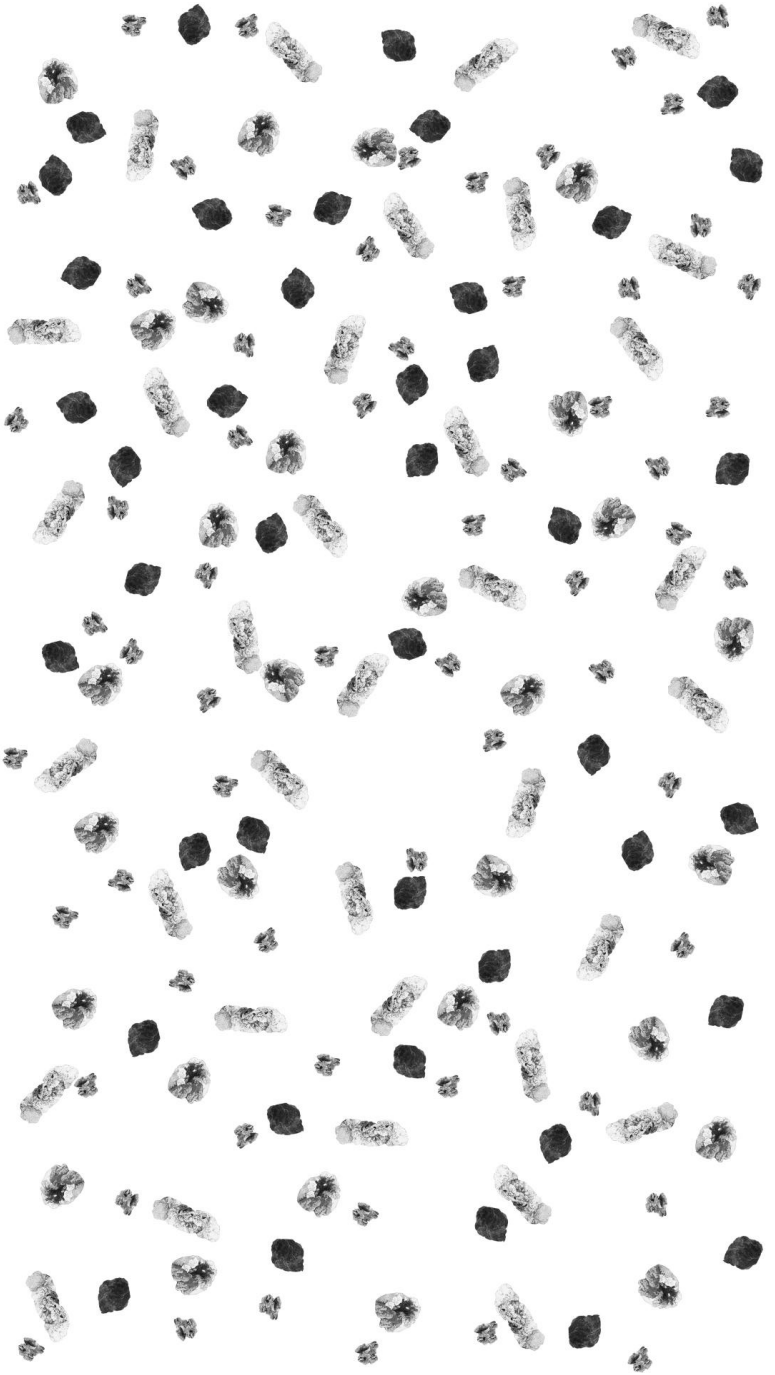
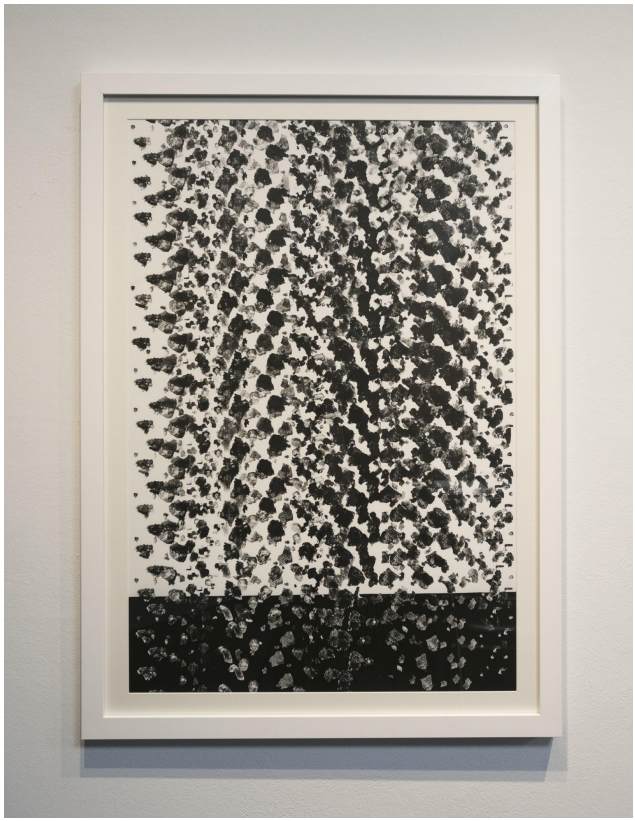
Figure 4. *Ritual*, 2018. Copper aquatint etching and gouache. Image courtesy of the artist.







Part two: Artworks made by during the *EarthArt* fellowship

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Figure 8a. **Pinch pots**, 2019.

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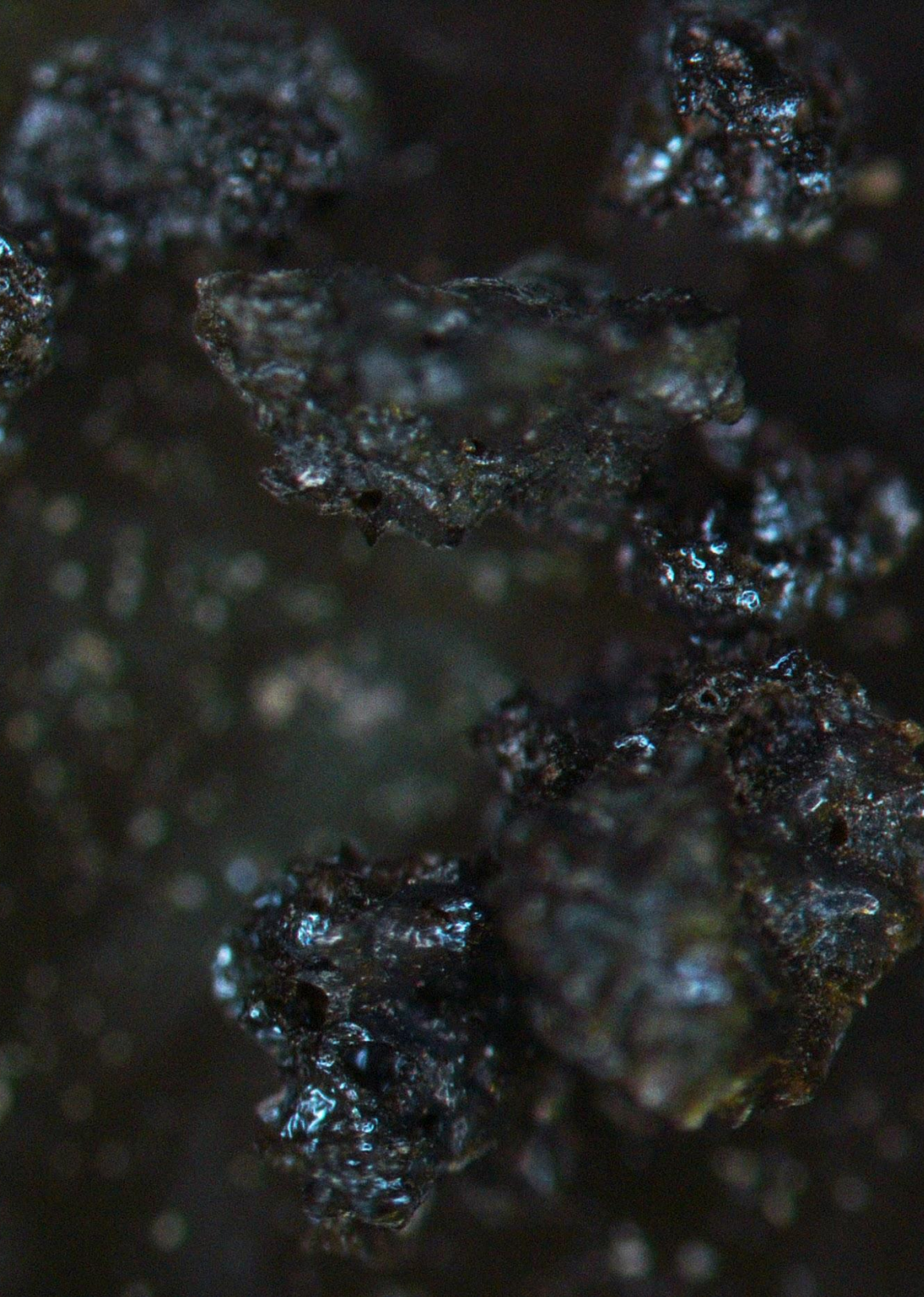
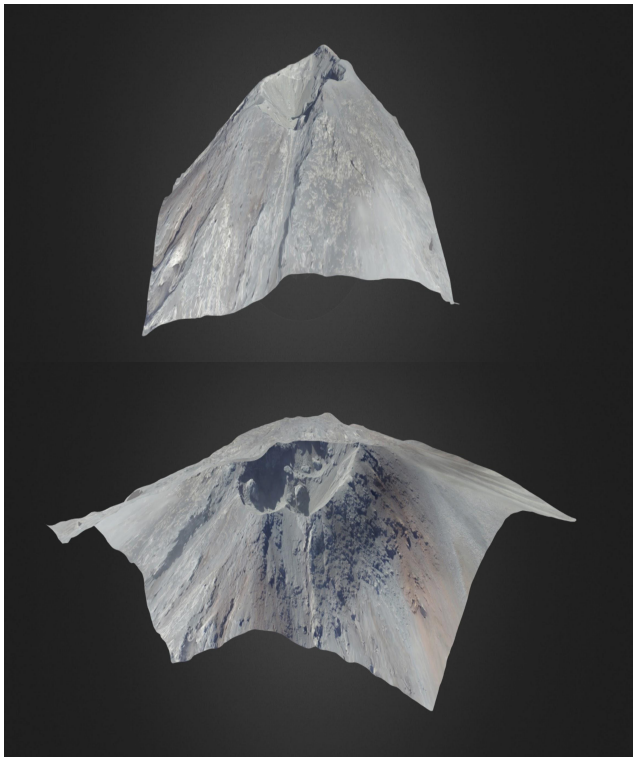
All installation shots, displayed at the *EarthArt* exhibition, Earth Sciences, University of Bristol. Photography by Milo Newman.

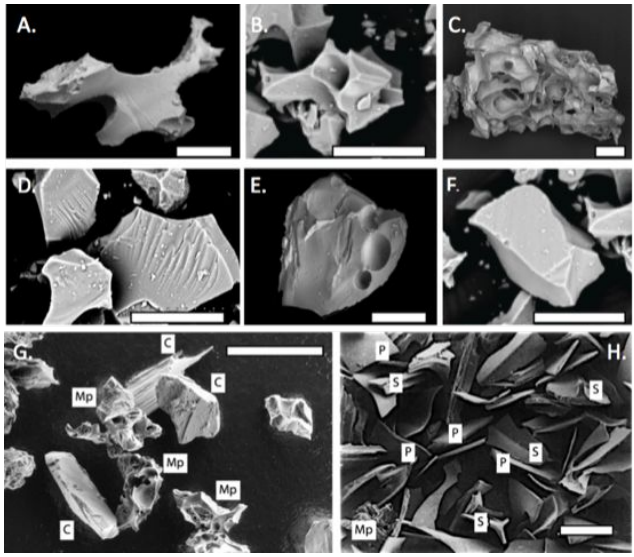




Part Three: Scientist Contribution

Figure a. **Dronedeploy, Fuego Crater Model.** Image courtesy of Matthew Watson.

Figure b. **Ash particle types.** Image courtesy of Kathy Cashman.



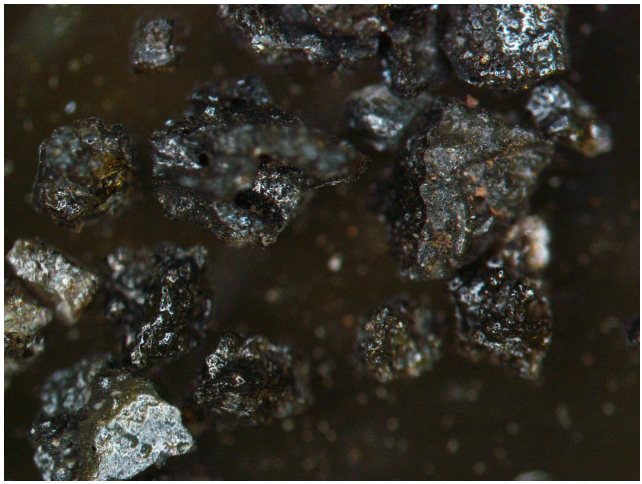


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Figure c. **Ash under microscope - Pacaya 2010, Dos Lunas sample**. Material courtesy of Matthew Watson, images by Olivia Jones. Another image also seen on page 22.

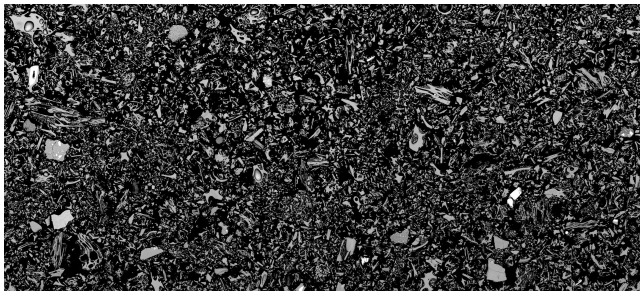
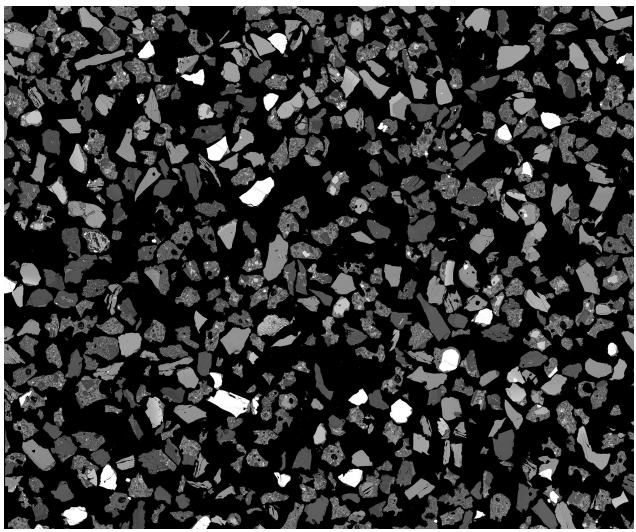


Figure d. **Mazama Ash.** Image courtesy of Hannah Buckland.

Figure e. **Fuego Ash.** Image courtesy of Hannah Buckland.



Cover image:

Figure. f. **2MIN_big square.** Image courtesy of Jennifer Saxby.

EarthArt fellowship: Olivia Jones

Part Three

Scientist contribution

Dr Matthew Watson

Dr Matthew Watson is a Reader in Natural Hazards in the School of Earth Sciences at the University of Bristol.

His research involves inversion of remotely-sensed data to retrieve physical parameters of volcanic plumes and clouds over several spatial scales, using both ground, airborne and satellite-based techniques. His interest in volcanic ash is driven by involvement in managing the Icelandic ash crisis in 2010. He has worked in Guatemala, the subject of a lot of his interactions with Jones, for twenty years.

Watson's current research involves the scientific investigation of ash particles. This includes using thermal infrared cameras to reconstruct ash clouds in three dimensions and using drones to sample ash. Flying into an ash cloud with a drone to capture ash is one of the most interesting challenges he has attempted recently: https://www.youtube.com/watch?v=gqolEjKQ3yE&t=7s

His research contributed to Jones' fellowship through conversations, sharing imagery, data and material relating to the Fuego eruption.

An interview with Dr Matthew Watson and artist Olivia Jones
by Georgia Hall
November 2019

Georgia Hall (GH): Matthew, it would be great if you could give us an overview of your work and your introduction to Olivia's practice.

Dr Matthew Watson (MW): As a brief overview of my research, I study what comes out of volcanoes because of the impact it has on the people and environment around them. This material contains information about how volcanoes behave that is hard to otherwise find. As scientists, we interpret volcanic emissions to tell us something about subsurface processes, as once it's erupted there are secondary downstream impacts which can be bad for the local population, such as ashfall killing crops and wildlife. The tiny shards of glass and acidic gases that come out of volcanoes lead one to explore its environmental impact. I have recently been focused on volcanic ash due to the 2010 Icelandic eruption, which reinforced the idea that even a fairly small eruption can have a profound influence hundreds of kilometres downstream. Although it wasn't a particularly large eruption, it was badly timed in terms of meteorological conditions, leading to the closing of the European airspace for six days.

When interacting with social scientists and people from the arts, there has been a temptation amongst scientists to think that it is one-way traffic, where they provide ideas upon which people hang ideas. I would have subscribed to that ten years ago, however, due to a series of experiences, I've realised that you are just as likely to learn whilst transmitting the information. The collaboration between artist Olivia Jones and myself was very much a two-way street. I learnt as much from Olivia as she did from me. The great thing about interacting with people who are very different from you is that they see things in such different ways. The ideas of anthropomorphisation within Olivia's work, rather than looking abstractly, was a mind-blowing concept that previously would have never occurred to me. A remarkably different way of thinking about things which, on my own, I would not have conceived. This is an oversimplification of what we did together but is an example of the possibilities if you open your mind. It is fun intellectually because it opens up spaces that you weren't aware of. Which goes back to

the first key message, that it really is a two-way street. A colleague described these collaborations as a *Road to Damascus*, being a real mind-opening experience.

Interestingly, it's something that is happening more within the discipline, with recent movements towards scientist, social scientist, historian and artist interactions. Science is opening up to all of these interpretations. I give due credit to the School of Earth Sciences at the University of Bristol, as it's something they have pioneered through hosting artist fellowships and creating an exhibition space. This has been pushed because they understand it is really exciting.

Olivia Jones (OJ): Looking back to one of the first meetings Matt and I had in my studio at Spike Island, the conversation broke down into three different ideas; firstly, entropy and order which connected to the material of volcanic ash and the processes and stages that it goes through. Secondly, the immediate physical connection with ash; what ash is and how you analyse it. And finally, how this all could be linked with the cosmicomics quote about *finding order in the dust*, focusing on the human endeavour and how we write about and anthropomorphise things. When exploring these complex ideas through open discussion with Matt, our conversation became very much about the human perspective connected to the materials as well as the experiential journey of the materials.

At the beginning of the fellowship, I referred to artists working with scientists, such as Katie Paterson, Olafur Eliasson and Damián Ortega, who I felt overpass direct representation well and encouraged me to think about how I could imaginatively approach the collaboration. For example, Katie Paterson regularly works with scientists. Working on a project using a Campo del Cielo meteorite, she cast, melted and reformed the meteorite back into the original mould to be returned to space by the European Space Agency. Although the molecular structure had altered, it remained the same visually. A grand gesture albeit seemingly small in the scheme of that materials 4.5 billion year journey. Starting the fellowship at the University of Bristol I was full of thoughts about the impact we can have on a materials journey during our existence.

MW: What struck me in Olivia's work was the approach of familiarisation - the characterisation of forms in an abstract space. I found that extraordinary. There are very complex physical interactions between the atmosphere, ash and people, which are always treated as something very objective and there can become a danger of doing this incessantly within volcanology. For example, The University of Bristol has written recent literature around interpreting fatalities including numbers of people killed from eruptions. Although some readers might be affected, the safest thing to do is treat it like a series of numbers, as otherwise, it would be quite disturbing. Students can read this and will not have an emotional or visceral response, but if you take them to the place of one of these events, it changes their responses.

Olivia's approach references this transformation, as she really well subtly hinted at removing the abstract by making her outcomes have personality through reflecting the people she worked with. I took that home with me. Some of the contorted shapes and the mediums she produced were in essence absolutely human; they are tactile, have personality and are expressive.

OJ: I was trying to reflect on spending six months at the university. Over that time, I had gathered a lot of information and experiences and I didn't want to recreate something which Matthew already does, such as 3D-modelling *(fig. a, p.23*). Within my artwork, I wanted to encapsulate all of the information and conversations. I wanted to not only show our collaboration but all of the conversations I'd had with volcanologists in the building who work with the material; thinking about where the materials rooted back to, following their paths and mapping out where those lines extended to.

MW: It's such a different way of looking at something we look at all the time but don't consider through this lens. If I had only given material to Olivia, it would have just been transmissive and not such an enriching experience for Olivia. And, for me, it would not have been as challenging or interesting.

OJ: I struck lucky being able to work with both Matthew and Prof. Kathy Cashman, as they have a very different way of talking about the materials and the processes they work with. I had imagined scientists would talk in a predominantly linear way about certainties but they also spoke about

possibilities and looking for the unknown. The way a scientific written paper is presented can be very factual and ordered but the way I saw it discussed was far more poetic.

MW: Scientific papers are supposed to be abstract, distant and evidence-based. If a scientist presents their work not fully abstract, there is immediate systemic pushback. Why can't people write emotive papers? Volcanology is an interesting example, as it's a very human experience and in turn is likely to be why people are interested in it. Volcanologists, seemingly far removed during their in-depth research, in their final analysis, connect to the effects of human beings. Could it be there is something about this discipline that is more acceptable to think about human consequences and therefore opening oneself up to being emotive? There is a human element that flows through this work that might not exist in other scientific areas. Previously, it has been characterised by a lack of rigour which is unfair.

OJ: There is a certain fascination with landscapes, the stories they contain and the materials we source from it, that is shared by scientists and artists alike. My reaction would have been different if working with another department, as within volcanology there is the humanistic element and material to work with. It is tactile and aesthetic. Certainty within the processes I ended up using, the material was really important. Without this, creating artwork might have felt less tangible. During my time at the university, in addition to prints, I created ceramics which was the first time I've worked with clay and glazes.

GH: Matthew, you kindly shared some drone footage with Olivia - could you explain what is happening in these videos and why this process is important?

MW: The scientific explanation for using drones is that it helps uncover the very little we know about what ash looks like within the hostile environment of clouds. To understand an ash cloud, it is key to interpret the material that has fallen out. However, this remains not wholly satisfactory due to there being some fairly serious problems or uncertainty; the process by which ash falls out is complicated and does not preserve very fine material well. Very simply, I realised that the best thing to do would be to try and get into the clouds to

gather some measurements and drones facilitated that. People did start doing this in 1970- 80s before realising that jet engines were susceptible to ash, leading to great reluctance to fly people into Ash clouds. Over the last few years, drones have enabled us to try that again *(fig. a, p.23)*. I had a thoughtful experience whilst watching a buzzard sitting on a telegraph pole. It's afforded an incredible perspective to fly anywhere in three dimensions and have a different view of the world. I felt that they had a superior view but at the same time maybe they think about how we move across landscapes. Drone flying has enabled this perspective and has an incredible value.

In 2015-16, alongside local Guatemalan scientists, we flew drones over Fuego for the first time. From afar, we flew it into the volcanoes kill-zone to have a look at the crater and brought it back again. This advancement of technology enables an important perspective. In the last year, drones have revolutionised how we look at and understand volcanoes, giving us access to places we wouldn't usually be able to go.

Essentially sending packing-foam wrapped in carbon three kilometres into the air is not normal. Using VR glasses creates an immersive experience as one can view the drone's front-facing camera in real-time whilst sitting at a safe distance in the tropics. It engenders a more emotional response that isn't trivial. You have a bird's eye view that's impossible not to be moved by.

OJ: It's such a juxtaposition, the two worlds of lab and field geology - the lab is encroaching on the fieldwork.

MW: In terms of learning and teaching, there is nothing quite like fieldwork, the messy, real-world, unlike the precision found in the lab. There is nothing compared to taking students into the field and watching them perceive, deconstruct and analyse.

OJ: You are forming memory connections of what you are learning.

MW: It is really about contextualizing what you have learnt; you can study mathematics, learning and understanding how different physical interactions work, but until you see the physicalities of what it makes, it is harder to comprehend.

GH: Matthew, you have previously mentioned how your conversations with Olivia made you reframe existing ideas, could you give an example of this?

MW: I can think of several examples, including, working collaboratively as previously mentioned, however, what struck me was my thoughts when looking at data. For example, when collecting ash from an ash cloud - using an expensive version of double-sided sticky tape attached to a drone - there's a very bland way to analyse the data to figure out where the ash is. It's abstract and dispassionate resulting in a population of different types of material sizes to form a line. Since working with Olivia, I have looked at this data through the eyes of someone else instead of looking at only the information content, I see them as emotive visual images. There is so much more there than an exercise of counting particle numbers. When multiple particles visually line up it makes me think about order and I personified these pieces that I would not have thought of before interacting with Olivia. It has encouraged me to think more about the processes that were required to make it.

OJ: I found the imagery and data that Matt shared with me fascinating, dissecting the visual material through the explanations that Matt shared and also through responsive interpretation. Looking for unified order in the research material, I found a tension that came into the play through reading the intention of each piece. For example, you wouldn't notice the nuances when looking at a single particle but when looking at multiplies, you naturally start to read one piece against another, thinking about how one part connects to another and how they are interacting.

GH: As well as imagery and data, Matthew, you also gave Olivia ash collected from the top of a hotel roof after the eruption of Pacaya Volcano in Guatemala, she used this as material within the newly produced works. Could you share with us how you use the material in your research and what it tells you?

MW: From a scientific perspective, the ash tells us about the nature of the eruption itself and holds information content, for example, the size, shape and material tell us about how it was produced. An analysis of ash shows

the different types of metals within it, particularly the silicone content, to inform us where the ash came from originally and its crystallinity.

Pacaya Volcano was an awakening for scientists because it wasn't the type of volcano expected to react how it did. Its eruption ground the airport to a halt and unfortunately there were a few deaths. The ash from the Pacaya eruption is uncommon, being unusual for this type of volcano to erupt and emit ash 20km away. This magma was quite runny which would make an explosion quite difficult. For example, Hawai'ian volcanoes produce beautiful fire fountains and lava flows and these types of volcanoes don't tend to produce a lot of ash, which is the opposite to Pacaya; except that, for some reason, it produced a lot more ash than we had expected it to. An explosive basaltic eruption is quite rare. The basaltic rock has a lot of crystals in it, which is measured from the air fall that changes the material behaviour, but the size can also tell you how energetic the eruption was. So, if it wasn't a particularly energetic eruption, it wouldn't be able to emit larger bits of ash. However, as this ash being quite large, a millimetre, and travelled a long way, 20 kilometres, we can understand how much energy was behind the blast out of the volcano.

OJ: This explanation really fit within my work in terms of thinking about material journeys; the type of exerted forces and the origins of the material. In my print series ***Outburst*** *(fig. 7),* I considered the earliest moments of material forming and explosive power of an eruption.

MW: You can then look into commonalities between other basaltic eruptions. One of Pacaya's closest analogues is Stromboli. One of the internal mysteries of these types of open vent systems where lava is constantly bubbling away is that every once in a while they explode. After displaying a fire fountain behaviour for months or years, it can quickly escalate into something much more significant and that's when people start to become affected by it. We still don't fully understand this behaviour. Some volcanoes are very predictable, almost having a heartbeat. Fuego erupted once a month for about three years, having four-tenths of the eruption before fully erupting, waning and then 24 days later exploding again. This cycle went on for years. On the other hand, with Pacaya's sudden explosions, it is very hard to understand. There's a lot about volcanoes that are easily anthropomorphised

as they each have their personalities. They all have behaviours that could be attached to people and the local populations inevitably talk about these things as they're very sacred and important to them.

OJ: You're right, it's how historically volcanoes have been written about within literature, being a living, breathing persona in the landscape.

MW: I am currently in a consortium to look at Fuego and never before have I written a proposal using the word *cosmo-visions.* It's exploring the locals' perceptions of the volcano. Social scientists will explore the local population and how they think about this system and their perception of it being the local worldview. If you find an open-mindedness, there is an extraordinary amount to learn. What I want to articulate is that the relationship that I had with Olivia is a microcosm of the way the field is going, from a consortium such as this to participatory workshops using art to communicate hazards. It has moved forward from a time where this would not be considered by scientists, to a time that it is seen as an added value within a proposal, through to where we are now, whereby we understand that collaborations are fascinating, important and give a more holistic approach to the way we think about interacting, learning from and co-developing with the local population. To do that, one needs to accept that their field isn't the only worldview. Traditionally, the temptation for risk prevention has been to find a scientist who knows about volcanoes to talk about hazards to local people. However, people have realised this method is not hugely effective so have developed new ways of interacting with the local populations that involve meeting them halfway.

GH: It seems there is a real increase of interaction through participatory events to explore the education of hazards to support and benefit people within their environments.

MW: I was recently interviewed by the BBC in a lab which opens out to the *EarthArt* Gallery and they were struck by Olivia's work. Being visceral and tactile, they kept stopping to look at the artwork. We had been broadly talking about volcanoes but the amount of time they spent looking at the work sparked more conversations despite being time-pressed.

Within a new project under consideration, there are a lot of people in the consortium that I am better equipped to interact with since working with Olivia. I understand what they are doing better and I can see where I can interact with them as a result of this fellowship. The project would be working with a lot of different people including artists, social scientists, historians, and therefore being a very holistic, well-rounded way to approach investigative science. There is a current question about whether or not you need lots of individual specialists who are willing to interact, or whether you need people who can think broadly. Being able to engage with people from different disciples is incredibly potent.

There has been a transformation in the perception of science recently, from *fundamental* abstract science through to socially relevant and impactful work applied to help somebody that might not have happened ten to twenty years ago. Argued by some as *blue-sky* thinking, others speak positively about interdisciplinary collaborations and how embracing the process allows for connections within society.

GH: Olivia, how did you see the fellowship expanding your practice, in addition to the material, data and new ceramic processes?

OJ: By looking closely at ash forms, the *EarthArt* Fellowship changed my work through grounding and rooting my series, ***Tephra in the Dust***. The joy of working with the physical material, with its relationship to place, time and people, is what I have subsequently taken into new work. I am thinking more about material journeys, my interactions with the materials and how that has been read and perceived. Also, referencing the physical landscape, I now want to do more to connect my work to places in the landscape as it creates a good platform to interact with other people, to have discussions and to collaborate with more people outside of the Arts. ■

EarthArt Initiative

The *EarthArt* fellowship, beginning in 2015, is an exploration of collaborations between contemporary artists and scientists from the School of Earth Sciences at the University of Bristol.

Earth Sciences encumbers not just rocks and fossils but increasingly climate change, oceanography 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 Olivia Jones in collaboration with the School of Earth Sciences at the University of Bristol.

Many thanks to the artist Olivia Jones and the scientists and academics, Dr Matthew Watson, Professor Katharine Cashman, Ailsa Naismith, Jennifer Saxby and Hannah Buckland of the School of Earth Sciences at the University of Bristol, UK. With continued 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 student volunteers.

With a special thanks to the kind donation from Sarah Robinson in memory of her late husband, artist David Robinson, who made this fellowship possible .

Booklet interviews, research and design by contemporary art curator Georgia Hall.
Edited and printed 2020.

EARTH GALLERY

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