

Surfaces of Time: Patination and Colouring in Vessel Making

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Slide 1:

Surfaces of Time: Patination and Colouring in Vessel Making



<p>Bronze Hydria 5th century BCE Raised and cast bronze Metropolitan Museum of Art</p>	<p>Koji Hatakeyama Incense Container 2011 Cast bronze and silver leaf National Gallery of Victoria</p>	<p>Adi Toch Shrouded IV 2021 Raised brass Sarah Myerscough Gallery</p>
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This presentation focuses on vessel forms made from copper alloys to reflect on the beauty and wonder of patina. Three case studies are chosen to consider correlations across time and place. They include bronze hydriai from Classical Greek Antiquity and contemporary vessels by Koji Hatakeyama from Japan and by Adi Toch from the UK.

Vessels have been used across time and place for everyday domestic purposes and for significant rituals and ceremonial events. As a maker, I am interested in the materiality and spatial dimension of vessels, the relationship between inside and outside, the associated ideas of public and private, the human body as a metaphor, as well as the notion of potential space afforded by the form. Adi Toch explains, 'the internal space of an empty vessel contains everything or nothing, depending on our perception. Not only do vessels form part of our lives, they also shape our perception of the basic division between inside and outside, the notion of moving from one framed space into another.' (Toch 2016).

This idea of moving from one framed space to another resonates more broadly with my analysis of patination that moves between ancient and contemporary examples. Patination is an intrinsically unpredictable phenomena, especially with copper alloys. It's incredibly difficult to predetermine and control the desired outcome. Working with patinas, means you must let go of any desire to control the colouring process and to embrace unpredictability. I'm intrigued by how contemporary makers work with patinas to enrich metal surfaces that give the appearance of ancient forms. How do makers such as Toch and Hatakeyama master such an unpredictable method?

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The go-to book for patination is Hughes and Rowe's 1982 publication *The Patination, Bronzing and Colouring of Metal*. Here's one of the colour plates showing different patination effects with yellow sheet brass. There are 84 patina recipes just for yellow sheet brass alone, 20 pages in total.





When I purchased this comprehensive resource as a design student, I was captivated by these colour plates. However, rather disappointingly, when I studied the recipes more closely, I was a little terrified by the sound of the chemicals – copper nitrate, potassium aluminium sulphate - so over time I have resorted to using more accessible chemicals with vinegar, salt, and household ammonia. By referring to the patination of bronze hydriai, I am now considering to further simplify the patina process by burying metal objects in the ground over long periods of time to strengthen notions of place in my work.

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Using Hughes and Rowe’s terms for patination methods, these samples are the result of tests with heating, immersion, and particle processes. Copper can be heated with a jewellery torch to create deep pinks and reds, brass when heated strobes oranges and blues. When immersed in hot water mixed with a few drops of liver of sulphur, pink copper transforms to a rich purple/black while brass turns a dull amber. The particle method, represented by the case studies, is the process that involves the most time for patination to take place with prolonged periods of burial in the ground described as a natural patination process and the use of acidic and alkaline chemicals such as vinegar and ammonia mixed with containers of sand, saw dust or wood shavings as artificial patination.





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	<p>Historical Vessels Classical Greek Bronze Hydria 7th – 3rd century B.C.E Raised bronze sheet metal and cast bronze Particle method via burial in the ground</p>
	<p>Contemporary Vessels Koji Hatakeyama (JP) 2010 & 2012 Cast bronze Particle method via burial in sand</p>
	<p>Adi Toch (UK) 2021 & 2022 Raised brass sheet metal Particle method via burial in the ground</p>
	<p>Vessels from my practice New Terrain in an Old World 2017 Wayfaring 2019-2022 Formed brass or copper sheet metal Particle method via burial in wood shavings</p>

Natural patination is a ‘complex electrochemical process’ (Privitera et. al 2021:2) referred to as ‘mineralisation’, when ‘the metal alloy reacts to the presence of an electrolyte solution on the alloy surface such as rainwater, soil water and/or atmospheric humidity depending on the exposure conditions’ (Privitera et. al 2021:2).

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Surfaces of Time: Classical Greek Hydria

				
<p>Late 7th century BCE Bronze Hydria Museum of Fine Arts, Boston</p>	<p>5th century BCE Bronze Hydria Metropolitan Museum of Art, New York</p>	<p>5th century BCE Terracotta Hydria Metropolitan Museum of Art, New York</p>	<p>4th century BCE Bronze Hydria National Archaeological Museum, Athens</p>	<p>3rd century BCE Bronze Hydria Metropolitan Museum of Art, New York</p>

The water jar or hydria is selected from Classical Antiquity to highlight the beauty of the patinated surfaces that have formed naturally by being buried in the ground for millennia. Reference to Classical Greek bronze hydriai sheds light on the labour-intensive processes involved in ancient practices, with the mining, refining, and working of metal.

Sourced from the Metropolitan Museum of Art in New York, the Museum of Fine Arts in Boston and the National Archaeological Museum in Athens, these examples from the 7th century to the 3rd century B.C.E show variations of form and iconography but consistent fabrication methods of raising and casting. Although defined as water jars, these bronze hydriai were used as funerary urns or trophies for sports events. Unlike terracotta hydriai during this period which incorporated on the vessel bodies pattern work and imagery of mythology interlaced with scenes of everyday life, here the metal surfaces are left unadorned with decorative elements reserved for the handles, base and vessel rim.

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Every material, in a way, is a becoming – it's not an object in itself but a potential to become something.

Tim Ingold, 'An Ecology of Materials' in Witzgall, S., & Stakemeier, K. (Eds.). (2018). *Power of material/politics of materiality*. pp. 59-65.

4th century (ca. 375-350) BCE Bronze Hydria
Raised bronze sheet metal
Cast bronze handles
Silver gilt
Metropolitan Museum of Art, New York

In Classical Greek Antiquity, bronze was valued for its tensile strength and lustrous beauty (Hemingway and Hemingway 2008) and was typically an alloy of copper and tin with a 'fairly constant proportion from 10% to 14% tin' (Hoover and Hoover 1912 notes in Agricola 1556). Other bronze alloys have been documented by Pliny the Elder in his *Natural History* (Hughes and Rowe 1982, Sowder 2008, Paparazzo 2003) including the addition of lead and iron.

This particular bronze hydria is an example of the use of silver gilt employed by ancient artisans to adorn the handles, the base and rim. The vertical pouring handle was typically sculptured into mythical figures, in this case according to the Metropolitan Museum, 'the figure is Boreas, the north wind, abducting Oreithyia, the daughter of Erechtheus, legendary king of Athens'. The cast components have reacted differently to the atmospheric conditions of its burial environment compared to the bronze body. Occurring as caramel and emerald hues, patinas of this nature were not the desired finish of the ancient maker but rather a 'golden sheen' (Sowder 2008) likely achieved by polishing the surface.

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The complex mineralisation process of natural patina is further understood when researching the composition of copper oxides that have been identified on the surfaces of bronze artefacts from archaeological burial environments. Mineralisation usually involves two layers – an initial layer of cuprite or tenorite overlapped by a secondary layer of the basic copper carbonates malachite and azurite (Privitera et al. 2021:2). These are some examples of copper oxides from mines in Australia, Kazakhstan, USA and Greece that provide a sense of the inherent colouring of patina.

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Having introduced Classical Greek bronze hydriai and natural patina, I now refer for a moment to my practice, first to fabrication methods followed by examples of my work, and then to objects by Adi Toch and Koji Hatakeyama, to highlight how the aged surfaces of ancient artefacts are in fact revered by contemporary makers.

Since 2017 I have been making simple, cylindrical vessels, some with lids, from copper, brass and silver sheet metal utilising doming, raising, forming, and soldering methods. Through this iterative vessel making process I have acquired haptic knowledge of how to work with these metals, so I am in awe of the fabrication methods used in Classical Antiquity involving charcoal fires and clay molds to form, solder and cast metal. Herbert Mayson in 'Metal working in the Ancient World' infers that 'work for soldering would be placed on charcoal in a clay pot on the fire, the charcoal heaped round the pot, and the fire blown up till the solder was seen to flow' (Mayson 1949:108). In comparison, I use a gas torch to anneal and solder sheet metal. I purchase sheet metal already refined and rolled from a metal supplier which today is posted in the mail. And I simply twist open a valve on the gas cylinder to light my torch.

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<p>Ovens for baking molds Modern example of ancient casting methods Mattusch, C. C. 1977</p>	<p>Pouring of bronze into funnels of molds packed in sandy earth Modern example of ancient casting methods Mattusch, C. C. 1977</p>	<p>ca. 460-450 BCE Bronze Hydria Handle Example of cast bronze created using similar casting methods to left images Metropolitan Museum of Art, New York</p>

Casting methods today are also modernised with ready-made jewellers wax which is purchased from jewellery suppliers and by employing commercial casters who use silicon molds to cast the wax designs. These images (above) of casting processes with clay molds are like those developed by ancient artisans, illustrating the laborious processes involved with baking the molds using charcoal fires and with casting metal forms in molds packed in sandy earth.

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Surfaces of time: Patination methods in my studio practice



New Terrain in an Old World 2017

Textured copper, brass, various patination finishes
Photo: Peter Whyte Photography



Wayfaring 2019-2021

Copper, brass, silver, various patination finishes
Photo: Peter Whyte Photography

New Terrain in an Old World is a series of small vessels that I created while living in Hobart for two years, from 2016-2018. To create this series I experimented with heating, immersion, and particle methods to develop a spectrum of hues from pinks through to dark purple/grey in response to the colours and textures of the dolerite landscape of kunanyi/Mount Wellington. This series formed part of a solo exhibition held not far from here (ANU) at Craft ACT in 2017.

The serendipitous outcomes of the patination effects led to the development of a new series of vessels titled *Wayfaring*. This title, inspired by Tim Ingold's writing about making, movement and materiality (2007, 2011, 2013), has conceptually framed my way of working which, in the context of contemporary practice, is slow, methodical, and time-consuming. *Wayfaring* aptly describes an iterative practice of object making that is akin to travelling slowly by foot through time and place, or using the words of Adi Toch, moving from one framed space into another.

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Particle method with brass lidded vessel

Wood shavings moistened with ammonia and vinegar
Vessel left untouched in a sealed container for 7 days

For both series I experimented with the particle method using wood shavings and saw dust mixed with 3 parts ammonia to 1 part vinegar, a ratio that produces green-blue patina on brass. The vessels by Toch and Hatakeyama have inspired me to further develop both natural and artificial patination methods using the particle approach.

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Surfaces of Time: Patination methods in Adi Toch's studio practice



Adi Toch b. 1979, currently lives and works in UK

Shrouded IV 2021. Brass, patinated by nature, five months in the ground, Ø 8 x 15 cm

In her studio practice, Adi Toch works mostly with vessel forms, hand raising them from thin sheets of metal by using hammering and soldering methods. Her focus on the surfaces of these vessels involves a variety of patination processes including particle methods including burial in the ground to allow nature to leave its trace on the surface. These examples of Toch's work are selected in this presentation to as they relate to the aged, patinaed surfaces of the Classical Greek hydriai that resulted from being buried in the earth.

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Adi Toch b. 1979, currently lives and works in UK

Brass vessel after 9 months buried in the ground
Adi Toch Instagram post, April 17, 2022

This returning of metal to the ground is conceptually significant for creating a loop between places of times past and the present-day. Toch's poetic gesture resonates with the ancient bronze hydriai by embracing the roles of unpredictability and place-time (prolonged burial in the ground), in the becoming of artefacts.

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Surfaces of Time: Patination methods in Koji Hatakeyama's studio practice



Koji Hatakeyama b. 1956
currently lives and works in Japan

Eight Faces 2010 (left)
bronze casting

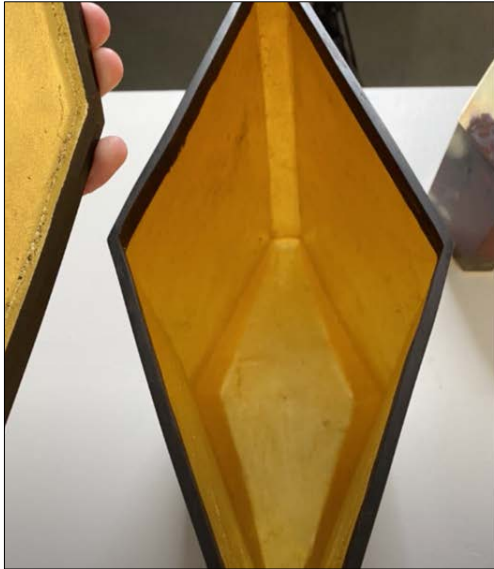
Octagon Shaped 2012
bronze casting

New Footing: Eleven Approaches to Contemporary Crafts,
The National Museum of Modern Art,
Tokyo 15 Sept. – 2 Dec. 2012

A highly revered maker both in his home country of Japan and internationally, Hatakeyama describes bronze as being a material with 'memories of a thousand years' (Jansen 2018). In a video about Hatakeyama's work titled *A Japanese Design* by The Scottish Gallery in honour of his 2020 exhibition with the gallery, Christina Jansen explains the processes involved in creating his bronze vessels. Hatakeyama works with traditional bronze casting methods to produce lidded vessels of contemplative beauty. Once cast, the vessels are buried in sand moistened with miso paste and vinegar and left for months to create colouring effects that echo the mountainous terrain of the area where he lives in Japan.

I was first introduced to his bronze vessels at the exhibition *New Footing: Eleven Approaches to Contemporary Crafts* (2012) at the The National Museum of Modern Art in Tokyo and was completely struck by the presence of the objects in the gallery space. The surfaces of these large forms appear painterly and iridescent with hints of the luminous yellow bronze at the base of the vessels. Since I was unable to interact with the forms, to touch them in any way or to remove their lids to view the interior and feel any sense of the object's weight, I had first interpreted them to be created from sheet metal and assembled through soldering methods.

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Koji Hatakeyama b. 1956

Gold leaf interior of cast bronze vessel
From the video, *A Japanese Design* 2020

In the video, Christina Jansen opens one of the large, lidded forms revealing a golden interior. The physicality of the object, the weight and mass of cast metal, is immediately perceived when hearing the sound the metal makes as the lid is removed.

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4th century B.C.E. Greek Bronze Hydria
containing cremated remains

Discovered in 2010 at the
Necropolis of Mesambria
in the Black Sea city of Nessebar

This valuing of the interior space by lining with the noble metals of gold or silver, echoes the significance of the bronze hydria when used as funerary urns, illustrated by this image of the discovery of a highly patinaed bronze hydria near the Black Sea that contained the precious cremated remains of what is believed to be a male individual (Sophia News Agency 2010).

Unlike the predominately smaller scale of my vessels and *Adi Toch's* that are fabricated from sheet metal, Hatakeyama's cast objects are more monumental in scale and weight. His use of bronze inspires me to explore this material. While *Toch's* investigation of burial methods inspires me to invite nature and the effects of place-time to take part in the becoming of my work. I am particularly

drawn to how the surfaces of these vessels make intimate and direct connection to place like the patina of the Classical Greek hydriai that reflect the location of their burial site.

Slides

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Bronze Hydria 5th century B.C.E, Metropolitan Museum of Art, accessed 12 November 2022.

<https://www.metmuseum.org/art/collection/search/257434>

Koji Hatakeyama, Incense Container 2011, National Gallery of Victoria, accessed 14 November 2022.

<https://www.ngv.vic.gov.au/explore/collection/work/100597/>

Adi Toch, Shrouded IV 2021, Sarah Myerscough Gallery, accessed 5 November 2022.

<https://www.sarahmyerscough.com/artists/52-adi-toch/>

Slide 2:

Hughes, R. and Rowe, M. (1982) *The Colouring, Bronzing and Patination of Metals*, Thames and Hudson, London, p. 57.

Slide 3:

Patina samples with copper and brass. Photo: Zoë Veness

Slide 4:

Bronze Hydria 5th century B.C.E, Metropolitan Museum of Art, accessed 12 November 2022.

<https://www.metmuseum.org/art/collection/search/257434>

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<https://www.sarahmyerscough.com/artists/52-adi-toch/>

Slide 5:

Late 7th century B.C.E Bronze Hydria, Museum of Fine Arts, Boston, 4 November 2022.

<https://www.mfab.hu/artworks/spartan-bronze-hydria-water-jar/>

5th century B.C.E Bronze Hydria, Metropolitan Museum of Art, New York, 12 November 2022.

<https://www.metmuseum.org/art/collection/search/257434>

5th century B.C.E Terracotta Hydria, Metropolitan Museum of Art, New York, 16 November 2022.

<https://www.metmuseum.org/art/collection/search/247244>

4th century B.C.E Bronze Hydria, National Archaeological Museum, Athens, 12 November 2022.

<https://www.namuseum.gr/en/collection/klasiki-periodos-3/>

3rd century BCE Bronze Hydria, Metropolitan Museum of Art, New York, 12 November 2022.

<https://www.metmuseum.org/art/collection/search/255222>

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4th century (ca. 375-350) B.C.E Bronze Hydria, Metropolitan Museum of Art, New York, accessed 14 November 2022. <https://www.metmuseum.org/art/collection/search/254776>

Slide 7:

Cuprite, Red Dome Mine, Mungana, Queensland, Australia, *The Arkenstone*, accessed 17 November 2022.

<https://www.irocks.com/minerals/specimen/48409>

Malachite/Azurite, Sir Dominic Mine, Flinders Ranges, South Australia, Australia, *The Arkenstone*, accessed 17 November 2022. <https://www.irocks.com/minerals/specimen/2243>

Cuprite and black tenorite, Itauz Mine, Dzhezkazgan, Kazakhstan, *The Arkenstone*, accessed 17 November 2022. <https://www.irocks.com/minerals/specimen/47332>

Azurite, Mina Christiana, Laurium, Greece, *The Arkenstone*, accessed 17 November 2022.

<https://www.irocks.com/minerals/specimen/41704>

Atacamite, New Cornwall mine, Kadina, Yorke Peninsula, South Australia, Australia, *The Arkenstone*, accessed 17 November 2022. <https://www.irocks.com/minerals/specimen/43538>

Slide 8:

Examples of my vessel making with copper and brass before patination. Photo: Zoë Veness

Slide 9:

Ovens for baking molds. Mattusch, C. C. (1977) Bronze and Ironworking in the Area of the Athenian Agora, *Hesperia: The Journal of the American School of Classical Studies at Athens*, 46(4):377.

Pouring of bronze into funnels of molds packed in sandy earth. Mattusch, C. C. (1977) Bronze and Ironworking in the Area of the Athenian Agora, *Hesperia: The Journal of the American School of Classical Studies at Athens*, 46(4):377.

ca. 460-450 BCE Bronze Hydria Handle, cast bronze, Metropolitan Museum of Art, New York, accessed 12 November 2022. <https://www.metmuseum.org/art/collection/search/248149>

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Veness, Z (2017) *New Terrain in an Old World*. Photo: Peter Whyte Photography.

Veness, Z (2020-2022) *Wayfaring*. Photo: Peter Whyte Photography.

Slide 11:

Particle method with brass lidded vessel. Photo: Zoë Veness

Slide 12:

Adi Toch (20 January 2022) 'In this new body of work...' [Instagram], accessed 5 November 2022. <https://www.instagram.com/p/CY8YLoesgUq/?hl=en>

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Adi Toch (17 April 2022) '9 months.' [Instagram], accessed 5 November 2022.

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Koji Hatakeyama, *Eight Faces* 2010, *Octagon Shaped* 2012. *New Footing: Eleven Approaches to Contemporary Crafts*, Exh. Cat. (2012), The National Museum of Modern Art, Tokyo.

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