HISTORY IN THE MAKING

ARTWORK LABELS

History in the Making showcases contemporary design across diverse creative fields to explore how the physical properties and origins of materials, design histories and narratives, are entwined with systems of production and, in turn, shape human culture.

Through the taxonomy or classifications of animal, plant, mineral and synthetic, the works on display create dialogues between the past, present and future of materials, in the production of designed goods and objects. They offer broad perspectives on social, ethical, environmental, economic and technological issues driving present-day innovation, debate, and change.

Drawn from the NGV Collection, *History in the Making* presents experimental, one-off and limited-edition craft and design, as well as mass-produced goods and fashion, highlighting the relationships between natural and synthetic materials, supply chains and markets, underpinned by approaches to design production, which are making history.

Animal

In the 1700s Swedish botanist and zoologist Carl Linnaeus developed a system of classifying nature under the kingdoms of plant, animal and mineral. Dividing the animal kingdom into classes – mammals, birds, amphibians, fish, insects and worms – Linnaeus classified nature in an attempt to bring rigour, order and logic to the diversity of biological life.

Linnaeus's system was a constructed hierarchy closely tied to European colonial expansion and power. It placed 'man' at the pinnacle, and in control of the biological pyramid. The legacy of this view, which underpins the modern industrial system, encourages the processing of food and material substances from animals.

The collection of works on display reveal some of the animals from which materials are obtained for use in contemporary craft and design, including hides, skins, bones, feathers, shells and corals.

The hunting and domestication of animal species is fundamental to many human societies, but the impact of intensive animal farming on animal welfare and the environment is questioned. International treaties for the conservation and protection of some animal species are persistently at threat from poaching, habitat destruction and climate change.

Whether founded in traditional cultural practices or facilitated by factory farming, the complex and often unbalanced relationship between human and animal has shaped material culture and continues to do so.

Humberto Campana designer
Brazil born 1953

Fernando Campana designer
Brazil born 1961

Estúdio Campana,
São Paolo manufacturer
Brazil est. 1983

Hippopotamus sofa, prototype

2017
rattan, leather, iron, coconut fibre, plastic, other materials

Purchased NGV Foundation, 2018 2018.1059

Drawing inspiration from the energy, colour, eclecticism and vibrant materiality of Brazilian street life, Estúdio Campana often works with low-fi or found objects and unexpected material combinations. Operating at the intersection of craft and design, its practice incorporates the idea of transformation, reinvention and application of craft skills and techniques in the production of beguiling objects that transcend traditions. *Hippopotamus sofa* is a design that explores these ideas; a mountainous form is meticulously handwoven using natural fibres in combination with cow leather procured from industry. This work emphasises how material choice connects to the processes of making, giving form to diverse shapes at scale.

Gali Yalkarriwuy

Galpu born c. 1948

Bänumbirr (Morning Star pole)

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Bänumbirr (Morning Star pole)

Bänumbirr (Morning Star pole)

2011 Ngaypinya, Northern Territory
Malwan (*Hibiscus*) (*Hibiscus tiliaceus*), butju (feathers), earth pigments, raki (fibre string), cotton

Purchased, NGV Supporters of Indigenous Art 2011 2011.417 – 2011.421

Bänumbirr (Morning Star poles) such as these are made for the Bänumbirr ceremony by members of Dhuwa moiety clans of north-eastern Arnhem Land. This exchange ceremony is used to establish connections between different peoples and to commemorate deceased relatives. Feathers at the top of the poles represent the Morning Star, Venus, and the feathered strings represent individual clans and their link to the Bänumbirr. Morning Star poles are statements of cultural identity: they represent specific stretches of Country and the people to whom they belong. In the eyes of their Yolngu makers, the poles also promote cross-cultural dialogue and transmit knowledge to their descendants.

Johnny Nargoodah
Nykina/Walmajarri born 1959

Trent Jansen
Australia born 1981

Ngumu Janka Warnti (All made from rubbish) high brown chair
from the *Partu* collection
2020
leather, aluminium

Proposed acquisition

‘Partu’, the Walmajarri word for ‘skin’, is the title of a 2020 design collection by artist, saddler and leather worker Johnny Nargoodah and designer Trent Jansen. This chair embodies cross-cultural collaboration, exploring hybrid design and shared material culture. Johnny Nargoodah’s leatherwork acts as a transformative skin, wrapping an upcycled aluminium security door, giving rise to a design object embedded with meaning. Nargoodah says, ‘[T]he leather gives it a reference to the history of Fitzroy Crossing and station life … the smell of that leather is so good. It brings back memories … of walking around the saddle room in Noonkanbah shed. There is a sensory response, that’s important’.

Sol Shapiro

Russia 1914 – Australia 1980, arrived Australia 1939

Armchair

1973

teak (*Tectona grandis*), sealskin

Purchased, 1974 D34-1974

Born and trained as a cabinet-maker in Russia, Sol Shapiro settled in Australia prior to the Second World War. Shapiro produced one-off pieces of furniture with biomorphic features inspired by natural forms, and *Armchair* is the quintessence of his style. Carved in teak, the arms, legs and backrest appear like limbs of a tree and the seat is upholstered in sealskin. Large-scale commercial hunting of seals in the extreme far north of Russia and Arctic Circle was severely regulated with the signing of the North Pacific Fur Seal Convention in 1911, marking the first international treaty for the preservation of wildlife.

Di$count Univer$e,
Melbourne fashion house
Australia est. 2009

Cami James designer
Australia born 1986

Nadia Napreychikov designer
USSR born 1987

Jacket

2015 autumn–winter, *Dreams and Screams* collection
leather, metal

Purchased, Victorian Foundation for Living Australian Artists, 2016 2016.4

Consistent with its trademark use of colour, graphics and slogans, Di$count Univer$e reinterprets the leather jacket, now a staple in the contemporary wardrobe. First practised by Palaeolithic people living through the Ice Age, the process of tanning animal skins using animal fat and plant oil to create leather is one of the earliest material inventions for clothing. Modern leather jackets were first worn by air-force personnel in the early twentieth century for warmth at altitude. By the 1950s they had been popularised by Hollywood, worn by filmic adventurers, rebels and bikers, later transcending the screen into popular culture as a fashion garment symbolising resistance to social norms.

Di$count Univer$e,
Melbourne fashion house
Australia est. 2009

Cami James designer
Australia born 1986

Nadia Napreychikov designer
USSR born 1987

Poodle dress, gemstone underwear and fishnet

2015 autumn–winter, *Dreams and Screams* collection
silk, plastic (sequins), elastic

Purchased, Victorian Foundation for Living Australian Artists, 2016 2016.5.a-c

Osklen, Rio de Janeiro fashion house
Brazil est. 1989

Oskar Metsavaht designer
Brazil born 1961

Shoes

2013
fish skin (pirarucu), rubber, cotton

Gift of Oskar Metsavaht for Osklen, 2014 2014.1940.a-b

Osklen is an environmentally conscious Brazilian fashion brand. These shoes are made from the leather of pirarucu, a large freshwater fish native to the Amazon River. South American people have used the fish for medicinal remedies, food and leather for thousands of years. Pirarucu skin has a tough, corrugated structure with a tensile strength greater than cowhide – useful protection from flesh-eating piranhas. Impacted due to overfishing for food, Brazil instituted a sustainable fishing strategy for pirarucu and use of legal fish hides in 1999. Today the skin is a prized material, which provides incentive to conserve stocks of older, larger fish rather than hunt them for food.

Stephen Jones, London millinery house
England est. 1980

Stephen Jones designer
England born 1957

Lady's day

1999 *Pic'N'Mix* collection, spring–summer 1999
feathers, polyester, plastic

Presented through The Art Foundation of Victoria
by Ms Janet Purves, Fellow, 2000 2000.150

Lady's day captures the essence of a large bird wing in flight. Stephen Jones achieves this sweeping wing with layers of white feathers sourced from domesticated birds, meticulously hand sewn to tulle. Feathers have long been associated with millinery. In nineteenth-century Europe and America the use of exotic plumage for ladies' hats was so popular it threatened the extinction of many bird species. It was even common to ornament hats with entire bird heads and wings. In response, organisations including The Royal Society for the Protection of Birds, founded in 1889, proved instrumental in lobbying British parliament to prohibit the hunting of birds for their plumage.

Manon van Kouswijk

the Netherlands born 1967,
arrived Australia 2010

Bib

1998
blood coral beads, cloth, cotton thread, gilt-metal

Purchased, 1999 1999.195

Manon van Kouswijk designs and makes jewellery characterised by repetition, often exploring the archetype of the beaded necklace by shaping and reproducing her own bead-like forms to explore its history and significance. Kouswijk's *Bib* neckpiece repurposes coral beads sourced from a vintage necklace. The beads are stitched to a cloth bib to appear like droplets of blood. Used as precious gemstone in jewellery for thousands of years, coral has fallen out of fashion. Threatened by pollution and climate change, the harvesting of precious red Corallidae corals for jewellery is considered controversial.

Aibom people, Chambri Lakes, East Sepik Province, Papua New Guinea

East Sepik Province, Papua New Guinea

Arm guard

20th century
tortoise shell

Presented through The Art Foundation of Victoria by C. T. Shipman, 1978 O6-1978

Throughout time, First Nations communities throughout Papua New Guinea have sustainably hunted animals as part of life and, in some cases, to create different types of body adornment. In recent years, human-induced changes to the earth's climate, mostly due to greenhouse gas emissions, has seen a decline in the populations of many animal species. As such, Indigenous communities have learnt to adapt working with new media and forms of expression. This historical arm guard is from the Aibom people of Papua New Guinea and was carved from turtle shell in the early twentieth century. The surface is engraved with complex geometric designs and has remnants of the lime fill and pigment.

Caroline Broadhead

England born 1950

Bangle

1975

silver, ivory

Purchased with the assistance of the Crafts Board of the Australia Council, 1976

D85-1976

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Marc Newson designer
Australia born 1963, lived in Japan 1987–91, France 1991–97, England 1997–

Noritake Co. Ltd, Nagoya manufacturer
Japan est. 1904

Set of four cups and saucers, from the Qantas A380 project
2007 designed, c. 2011 manufactured
bone china

Dinner set, from the Qantas A380 project
2007 designed, c. 2011 manufactured
bone china

Tea service, from the Qantas A380 project
2007 designed, c. 2011 manufactured
bone china

Proposed acquisition

In 2007 Marc Newson was engaged by Qantas Airways to redesign the interior of the airline's fleet of twelve Airbus A380s, the world's largest passenger airliner. Newson's mass-produced dinnerware in bone china, to be used by passengers across first and business classes, was developed with consideration of durability, weight, aesthetic appeal and price. Made from a composition

of cow bone ash, kaolin and feldspar, bone china was invented in 1748 at the time of the industrial revolution in the United Kingdom. Proving a versatile porcelain for manufacturing, the material recipe spread to Europe and Japan in the early twentieth century owing to the emergence of global markets for standardised consumer products.

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Pirjo Haikola

Finland born 1979

Urchin corals

2020

purple sea urchin (*Heliocidaris erythrogramma*) and black sea urchin (*Centrostephanus rodgersii*) biopolymer

Purchased with funds donated by Brendan and Grace O'Brien, 2020

Around the world, kelp forests are being devastated. Overfishing of their predators, coupled with increasing ocean temperatures and nutrient levels, have led to an explosion in sea urchin populations. By eating marine plants including kelp, sea urchins swarms can reduce ecosystems such as kelp forests to wastelands, threatening marine species and habitats. In an effort to stimulate commercial-scale harvesting of sea urchins, Dr Pirjo Haikola's *Urchin corals* are 3D-printed from her newly invented urchin biopolymer – a material made with the shells and spikes of the purple and black sea urchin. Widespread removal of the urchins to produce the material could offer a new design solution to this pending ecoloical disaster.

Nancy Kiwat
Meriam Mir born 1971

Fred Kiwat
Meriam Mir born 1975

Gazir lagoon I
2017 Erub (Darnley Island), Torres Strait Islands
shells, seeds, nylon thread, metal

Purchased, Victorian Foundation for Living Australian Artists, 2018 2018.9

Plant

Without plants, planet earth would be inhabitable. They produce the oxygen we breath and are the basis of most of the earth's ecosystems. Deeply enmeshed within human life, society, culture and economies, there is perhaps no more important natural foundation for human civilisation than our relationships with plants.

Plants formed a central part in the emergence of human society and permanent settlements twelve thousand years ago, as cultivated, harvested, processed, stored and traded agricultural systems replaced the gathering and foraging of plants. Around the world, from remote villages to metropolises, plants remain a vital source of food, fuel and raw material for clothing, goods and housing.

The unique physical and mechanical properties of different plant species have given rise to countless applications. A diversity of craft practices, technological inventions and industries have developed alongside agriculture and forestry, leading to a vast marketplace of plant-based materials, from textiles and timber, to rubber latex and biopolymers.

As we shift away from non-degradable and unsustainable resources, demand for plants will continue to soar. Some plant species are being logged to the point of extinction, while others belong to vast industrial monocultures. Today, for better or worse, the make-up of plant life has been redesigned by humans through landscaping, consumption and selective breeding.

Damien Wright

Australia born 1969

5:45pm 18/02/2020 bench seat

2020

polypropylene, red gum (*E. camaldulensis*)

Proposed acquisition

The vast timescales of organic and inorganic materials are foregrounded in this monumental bench seat. The shimmering slab of river red gum was cut from a 10,000-year-old tree excavated from a quarry on Yorta Yorta Country in Victoria's Murray Goulburn region. When timber is buried for so long it is starved of oxygen and saturated with iron and silica; the oxidised material that results is part timber and part fossil. Often buried deep down for millions of years, organic materials, plants and trees can transform further into organic compounds, including crude oil. Oil, a fossil fuel, is a key ingredient in the polypropylene used for these ubiquitous, long-lasting plastic chairs.

Anton Gerner

Australia born 1970

Huon pine sculptural drawers

2011–19

Huon pine (*Largarostrobus franklinii*), Black Bean (*Castanospermum australe*), plywood, nickel silver

Purchased, Victorian Foundation for Living Australian Artists, 2020 2020.157.a-g

These drawers are crafted from a single block of salvaged Huon pine, a soft, slow-growing timber from Australia's oldest living tree species. Respectfully sawn and reassembled to minimise wastage from the 200-year-old block of wood, the piece is likened to a three-dimensional jigsaw puzzle, with a hand-carved surface. Subjected to extensive overlogging in the past, Huon pine is endemic to the rainforests of Tasmania. It is now illegal to fell living trees, and access to timber from dead trees is regulated. Gerner's respect for these ancient trees informed his thoughful approach to the work's design and construction.

Tate Anson Furniture, Melbourne manufacturer
Australia est. 2011

Tate Anson designer and maker
born 1982

Tryst, stool

2011
European beech (*Fagus sylvatica*)

Yvonne Pettengell Bequest, 2014 2014.262

Industrial designer Tate Anson has used computer numerical control (CNC) waterjet cutting technology to construct a lightweight and durable design that capitalises on the strength of European beech. The high-velocity garnet particles in the waterjet, including rubies, sapphires and diamonds, cut a pattern of continuous parallel lines in the hard solid timber of the stool's legs, enabling the timber to be stretched into a delicate fan-like design that is structurally robust. Anson developed the innovative technique through an investigation into new tools and manufacturing processes for timber with the purpose of producing designs that maximised the performance of different timber species.

Lucy McRae designer

England born 1979, arrived Australia 1979, lived in England and the Netherlands 2001–

Prickly lamp

from the *Broached Colonial* collection
2019
timber, brass, aluminium

Purchased, Victorian Foundation for Living Australian Artists, 2020 2020.756

Lucy McRae's *Prickly lamp* uses 60,000 hand-dyed toothpicks to encase the 'body' of a lamp in a protective layer. Seemingly inconsequential, toothpicks are mostly made from plastic or wood and were invented by American innovator Charles Foster, who made it his mission to create heavy demand for them. In 1870 Foster's patented machines could produce millions of toothpicks per day, heralding our contemporary era, where the small act of picking one's teeth after eating results in vast production and waste. The toothpick shows that a material object that is enmeshed deeply in human culture can reach epic levels of ubiquity.

For kids

Have you noticed that sometimes objects can look like people or animals? Lucy McRae likes to play with different materials and objects to make ‘creatures’ that look like a cross between people, animals and technology. What do the spikes on *Prickly lamp* look like to you?

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Joyce Moate

Taungurong c. 1945–2004

Food basket

1997 Healesville, Victoria
bull rush grass, black boy grass (*Xanthorrhoea macronema*)

Gift of Catherine Allen, 1999 1999.339

In earlier times, food baskets were used for carrying all different types of food, as well as fish. This circular mat is woven using the coil stitch and the edges are joined, leaving a generous opening on one side. In the early 1990s, Joyce Moate was introduced to basketry weaving. Since then, she has explored forms and techniques traditional to south-eastern Australia. Moate seeks out strands of grasses, rushes, reeds and other plants endemic along the waterways and coastal regions of Victoria and New South Wales, also making natural dyes by boiling berries and barks in her outdoor studio.

Jean Louis Iratzoki designer
France born 1965

Alki, Itsasu manufacturer
France est. 1981

Kuskoa bi, armchair

2014 designed, 2016 manufactured
bioplastic (beet, cornstarch, sugarcane), limed oak

Purchased with funds donated by Gordon Moffatt AM, 2017 2016.1039

Heralding the acceleration of a biomaterial revolution, where industry no longer uses fossil fuel–based plastic polymers, this armchair is the first commercial chair to be thermoformed in a bioplastic derived from beet, cornstarch and sugarcane. Iratzoki's studio was involved in the research and development of the new compound, which is obtained using a series of mechanical processes, followed by a fermentation period. The resulting organic biopolymer can be injected, extruded and thermoformed into shape and is 100 per cent biodegradable. This armchair demonstrates how the invention of a new material can lead to sustainable design solutions.

For kids

Imagine if everything made from plastic could be thrown into the compost heap to break down instead of sitting in landfill for thousands of years. Designer Jean Louis Iratzoki and furniture manufacturer Alki have made it possible to create furniture with a biodegradable plastic that does exactly that. Even though it looks like normal plastic, the seat of this chair is actually made from plant materials: a beet, cornstarch and sugarcane mixture called bioplastic. This means if the chair is thrown away it will break down much like plants would.

Martin Corbin

England born 1949, arrived Australia 1980, died 2017

Set of spoons

c. 1984

she-oak (*Casuarina sp.*), flame oak (*Stenocarpus sinuatus*), almond wood (*Prunus amygdalus*), beefwood (*Grevillea striata*), bracelet honey myrtle (*Melaleuca armillaris*), mulga (*Acacia aneura*), black myrtle (*Baeckea sp.*), brey mangrove (*Avicennia marina*), coastal bead heath (*Erica sp.*), black tea tree (*Melaleuca sp.*), olive (*Olea europae*), myall (*Acacia pendula*), myrtle beech (*Nothofagus cunninghamii*), blackwood (*Acacia melanoxylon*), red locust (*Robinia sp.*), red cedar (*Toona ciliata*), Broughton willow (*Acacia salicina*), Blakely's red gum (*Eucalyptus blakelyi*), wilga (*Geijera parviflora*), banksia (*Banksia sp.*), brown hazelwood (*Lysicarpus augustifolius*), ebony (*Diospyros sp.*), macadamia (*Macadamia sp.*), purpleheart (*Peltogyne paniculata*), river she-oak (*Casuarina cunninghamiana*)

Purchased, 1985 D6.a-y-1985

Wooden spoons are among the oldest utensils made by humans. Martin Corbin's collection of twenty-five spoons from 1984 is representative of designs for eating, serving, cooking and measuring food. The shape and size of the bowl, neck and handle of the spoon are informed by its function at the table or in the kitchen. For example,

the curvature of an oval bowl with a mid-length handle indicates a spoon for the mouth and a small bowl with short handle is used for measuring. The unique properties of the different woods used lend themselves to the small functional objects, where shape, weight, strength and durability are important factors in a successful design.

Robert Ebendorf

United States born 1938

Necklace

c. 1988

newspaper, 24ct gold leaf, lacquer, copper, ebony, wire

Gift of Mr Thomas J. Weisz, 1988 D12-1988

Robert Ebendorf's jewellery is noted for its novel combinations of materials, selected for their expressive effect. In *Necklace*, the primary material, covering the large spherical beads, is a Chinese-language newspaper. Two of the spheres are covered in gold leaf and black lacquer. Small copper discs position the spheres, and the intervening small beads are made of ebony. In this piece the materials are a mixture of the ephemeral and discarded, and worthless and valuable, with equal consideration given to the construction of all the elements, regardless of their status or permanence.

Julia Manheim
England born 1949

Bangle
1977
Ebony (*Diospyros sp*.)
ed. 2/10

Purchased, 1977 D333-1977

Julia Manheim is known for her jewellery and sculptural bodywear made from paper, glass, plastic, metal and wood. Created from reclaimed ebony, *Bangle* features meticulously carved pleats around its oval section. Prized for its fine-grained jet-black wood, ebony is a slow-growing tropical tree endemic to Africa and South-East Asia. Ebony, threatened by illegal logging, forest clearing for agriculture and the poaching of wild animals (vital for the distribution of its seed), is listed on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, in the category of ‘critically endangered to vulnerable’. Supply chains of ebony are some of the most regulated in the world, with the sale and importation of finished objects banned or controlled in many countries.

Hanesbrands Inc, North Carolina

United States est. 2006

Hanes Men’s Short Sleeve Beefy-T®

c. 1970 designed, c. 2021 manufactured
cotton

National Gallery of Victoria, Melbourne

Few items of clothing are as iconic and ubiquitous as the T-shirt. The plain white cotton knit T-shirt, with short sleeves and crew neck, was manufactured on mass by the P. H. Hanes Knitting Company founded in 1901 in North Carolina, USA. Becoming standardised undergarments for American sailors in 1913, by 2000, the company celebrated the sale of their one billionth *Beefy-T*, which was specifically developed in the 1970s to accommodate a growing fashion trend of screen-printing images and slogans on T-shirts. A symbol of fast fashion in twenty-first century, every T-shirt’s water footprint is enormous, consuming 2700 litres to grow and process the cotton.

Karl Lagerfeld, Paris fashion house
France est. 1984

Karl Lagerfeld designer
Germany 1933 – France 2019, lived in France 1965–2019

Boots
1994
leather, linen, metal

Presented through The Art Foundation of Victoria by Ms Janet Purves, Member, 1996
1996.565.a-b

Boots, 1994, reveals historical influences in a contemporary context. Referencing nineteenth-century Balmoral laced walking boots, Karl Lagerfeld uses linen for the shoes' upper pieces and laces. Linen is produced from the fibres of flax, one of eight plant species first domesticated by humans in south-west Asia more than 9000 years ago. A foundational crop along with wheat and barley, flax was long cultivated for food and textiles, revered for its durability and comfort in cool and warm climates. Becoming of great social, cultural and economic significance to Europe from the Middle Ages, flax and the production of linen goods was hit hard by the advent of cheap decorative cottons in the nineteenth century.

Kyoko Hashimoto designer

Japan born 1980, arrived Australia 1991

Coal musubi neckpiece

from the *Musubi Neckpiece* series
2019
coal, vegetable tanned kangaroo skin, eucalyptus wood, waxed linen

Purchased, Victorian Foundation for Living Australian Artists, 2019 2019.254

Made from rough lumps of coal collected from Wollongong, NSW, this necklace explores the concept of the ‘supply chain’, the often non-transparent and complex sequences of resource extraction, transportation and processing that precede the production and distribution of most consumer goods. Used as fuel to generate coal-fired electricity, which accounts for the largest share of Australia’s electricity production, and to make steel, coal forms a fundamental and environmentally challenging part of the modern supply chain. Using deeply buried plant matter that is hundreds of millions of years old, Hashimoto’s piece invites us to ponder the many ways coal powers manufacturing and underpins our consumption patterns.

For kids

Did you know that plastic is made from oil, and that a lot of the electricity that is used to manufacture plastics and products is generated by burning coal? Coal and oil are called fossil fuels because, like fossils, they are formed when organic materials such as trees and plankton are buried deep underground and exposed to the heat and pressure of the earth's ground over millions of years.

Ishohi Setsuko
born 1964

Layered lotus petals
Renben 蓮弁
2011
bamboo, rattan, lacquer

Purchased with funds donated by Baillieu Myer AC and Sarah Myer, 2016 2016.107

Prized for its incredible strength and structural flexibility, bamboo is a ubiquitous material in Japan and has been used to produce functional, everyday objects for centuries. It is also central to ritual and ceremony: bamboo-woven baskets have long been used in Buddhist and Japanese tea ceremonies with master-apprentice lineages established to preserve and continue the craft. During the twenty-first century, a new generation of makers began to push the boundaries of bamboo to produce contemporary sculptural forms. This abstract work is a playful nod to the artist's background in ikebana (Japanese flower arrangement). One of few women bamboo artists in Japan, Isohi first experimented with the medium while creating vessels for her own arrangements.

Mineral

The extraction, refinement and use of minerals is fundamental to the development of material culture, technology, industry, supply chains and economic systems. Prized for their natural chemical properties – as the basis for metals or resources for energy production – minerals have long been searched for, mined, traded, refined and put to work in the service of everyday life.

Most minerals integral to modern economies formed over vast spans of time. Gold was created in neutron star collisions and supernovae before the solar system formed. Copper travelled through the veins of magma chambers deep under the earth's crust and silica comes from sand eroded from rocks over many millions of years.

For thousands of years, mineral extraction to produce metals, alloys and glass was relatively small in scale. Modern systems of commodity extraction and trade, propelled by developments in metallurgy, engineering and the industrial revolution, have enabled vast industries to emerge. Through their efficient extraction of minerals, such as iron ore, bauxite and coal, these industries have fundamentally reshaped human civilisation.

As we extract minerals at great scale, we are learning of the environmental consequences – and while coal and iron ore may be the minerals that enabled industrialisation, minerals such as silica for solar panels and petalite for lithium batteries may come to define the twenty-first century.

Joris Laarman designer
the Netherlands born 1979

Joris Laarman Lab, Amsterdam manufacturer
the Netherlands est. 2004

Microstructures, aluminium gradient chair, prototype

2014
aluminium

Donald Russell Elford and Dorothy Grace Elford Bequest, 2017 2016.425

This chair is 3D printed in aluminium using a computer algorithm that emulates bone structures in nature by modifying the cellular structure, thickness, density and pattern of the printed material according to the structural requirements of the chair. Industrially made from bauxite ore, aluminium was more expensive than gold in the nineteenth century due to the energy-hungry processes of production. By the twentieth century, cheap coal-fired electricity transformed the process. As production soared, prices plummeted, and global demand for the lightweight, durable and corrosion-resistant alloy turned it into the second most commonly used metal after iron. Australia is the world's greatest producer of bauxite, supplying 30 per cent of the world's total.

Michael Gittings

Australia born 1989

Standing cabinet

2019
stainless steel, glass
artist's proof

Purchased, Victorian Foundation for Living Australian Artists, 2020 2020.624

Michael Gittings is a trained roofer with refined skills in metalworking. *Standing cabinet* is fabricated in stainless-steel sheet and demonstrates an exemplary control of heat to cut, shape and weld the alloy. In comparison to basic carbon steel, stainless steel is manufactured from a mix of iron ore, chromium, silicon, nickel, carbon, nitrogen and manganese. This composition, while making the alloy harder to work, prevents the steel from rusting. In a race to perfect 'rustless steel' for the manufacturing of armaments in the early 1900s, metallurgists across Germany, England and the United States applied for numerous patents. In 1913, Harry Brearley of Sheffield was finally credited with the invention.

Cini Boeri designer
Italy born 1924, died 2020

Tomu Katayanagi designer
Japan born 1950

Fiam, Tavullia manufacturer
Italy est. 1973

Ghost, armchair

1987 designed, 2016 manufactured
glass

Purchased with funds donated by Gordon Moffatt AM, 2017 2017.1

Ghost, armchair is made by slumping a single sheet of clear glass over a mould at high temperature in a kiln. Marking a technical breakthrough in the manufacture of glass furnishings, this chair sits in a continuum of material innovation, commencing in 4000 BCE and perfected by British engineer Alastair Pilkington in the 1950s, resulting in flat, uniform, thick sheet glass. Few materials have played such an important role in shaping human culture as glass. Made from molten silicon dioxide or quartz sand, soda ash and limestone, it has proved fundamental in the history of the built environment, objects, artefacts, modern devices and technology.

Talin Hazbar

Syria born 1988

Accretions #1

2019 designed, 2020 made
stainless steel, calcified organic matter, brass, lighting components

Commissioned by the National Gallery of Victoria, Melbourne
Purchased with funds donated by Gordon Moffatt AM, 2020 2020.744 a-b

Accretions continues Talin Hazbar's ongoing enquiry into the organic processes capable of creating ornament, structure and form. Drawing on the natural systems of the ocean, where calcium accumulation and accretion is commonplace, Hazbar repeatedly submerges hand-forged steel armatures in the waters off the coast of Sharjah in the United Arab Emirates to encourage the growth of molluscs, crustaceans and corals. The calcium carbonate structures these life forms construct on the armature transform it into an ornate light shade. *Accretions* offers an example of how designers can work collaboratively with nature to grow structures and produce materials of great functionality and unique beauty.

For kids

Did you know that seashells and corals are made by microscopic organisms in the ocean? These tiny life forms make their protective shells by combining carbon and oxygen with minerals like calcium that have been washed into the ocean from rocks or old shells. When the shells are no longer needed, they are dissolved back into the ocean or compressed on the sea floor into new rock. This material is waste free and is naturally recycled over and over again. Talin Hazbar's lights were sunk in the ocean for a long time so they would be covered in tiny shells, crustaceans and corals. Hazbar is drawing our attention to nature's sustainable systems.

Lukas Wegwerth

Germany born 1984

Crystallization 146

2019

porcelain, salt crystals

Purchased with funds donated by Esther Frenkiel OAM and David Frenkiel, 2020 2020.117

Lukas Wegwerth repurposes an existing ceramic vessel by transforming it into hosts for the growth of salt crystals. Submerging the vessel in a saline solution, the cracks are slowly colonised by crystal formations over time. The artist's process references the fifteenth-century Japanese art of fixing broken pottery called *Kintsugi* or 'golden repair'. *Kintsugi* is also related to the Japanese concept of *mottainai*, which encapsulates a sense of regret when something is wasted. This sense of regret broadly acknowledges that all objects, broken or not, have an intrinsic value – a sum of natural resources, energy and human capital. For Wegwerth, using the crystallisation process symbolises the interdependence of the human made with the natural.

Mark Edgoose

Australia born 1960

Lidded serving dish

1992

titanium, gilding metal, nickel plate, silver

Purchased through The Art Foundation of Victoria with the assistance of BP Australia Limited, Governor, 1992 D31.a-b-1992

Mark Edgoose's metalwork explores notions of containment and function using metal alloys employed in the manufacture of artillery and aerospace. Made from a mixture of base metals and chemical elements, alloys are human inventions, with mechanical and physical properties considered useful for different applications. Comprising copper and zinc, gilding metal, as used by Edgoose in *Lidded serving dish*, has been employed to make the full metal jackets of ammunition since 1882. The alloy case prevents the lead projectile from expanding on contact with the body and improves the feeding of the bullets into the gun cartridge. This seemingly innocuous alloy is a strategic material in the war economy.

Marc Newson designer

Australia born 1963, lived in Japan 1987–91, France 1991–97, England 1997–

Noritake Co. Ltd, Nagoya manufacturer

Japan est. 1904

Cutlery set, from the Qantas A380 project

2007 designed, c. 2011 manufactured
stainless steel

Proposed acquisition

Made from stainless steel, Marc Newson's cutlery for Qantas Airways's A380 airliner has its origins in design production commencing in the early twentieth century in Sheffield, England. The city was a centre for the manufacture of Western cutlery since the sixteenth century, providing context for metallurgist Harry Brearley's invention of stainless steel in 1913. Susceptible to rusting, cutlery forged in carbon steel required constant polishing and silver was expensive. Experimenting with metal alloys and food acids, Brearley's discovery of corrosive-resistant chromium steel provided a solution for the mass production of inexpensive, hygienic cutlery. Stainless steel remains one of the most commonly used metals for myriad industrial, consumer and medical products globally.

Godwin Baum

Germany born 1955, arrived Australia 1982

Necklace

1986

22ct gold, haematite, quartz

Purchased from Admission Funds and with the assistance of the Crafts Board of the Australia Council, 1986 D38-1986

Sieglinde Karl

Germany born 1943, arrived Australia 1953

Pin

1983

enamel on copper, steel

Presented through the NGV Foundation by John McPhee, Fellow, 2005 2005.287

Sari Liimatta

Finland born 1977

Phoenix, pendant

2009 Lappeenranta, Finland

glass beads, steel pins, oxidized silver, plastic

Purchased NGV Foundation, 2013 2013.91

Synthetic

Formulated in chemical laboratories, synthetic materials were developed in the nineteenth and twentieth century. Cheaper and more reliable to produce, the invention of synthetics was stimulated by the scarcity and high cost of natural materials, such as ivory, silk and natural latex rubber. Accelerating since the 1930s, industrial use of petrochemical-based acrylics, polyesters, silicones and polyurethanes has dramatically transformed the material world – and we now live in what is called the ‘plastic age’.

Recognising the useful role synthetic materials have performed in modern society, their impacts, both positive and negative, come with costs. This new synthetic kingdom comprises non-degradable materials. Put to use in vast quantities in contexts not supported by adequate recycling and disposal, huge amounts of waste and pollution are having unanticipated effects on human health and the earth’s natural systems.

Within this context, a new era of human-designed and made goods is emerging focused on new organic compounds and biomaterials that embrace the circular economy.

When employed in a system of design and making – small or large – both synthetic and natural materials represent a constellation of ideas, choices, values and principles configuring in a moral culture. This is a complex and confronting reality not only for designers, makers and manufacturers – but for all of us.

Viktor&Rolf, Amsterdam couture house
the Netherlands est. 1993

Viktor Horsting designer
the Netherlands born 1969

Rolf Snoeren designer
the Netherlands born 1969

Look 4, F* this I am going to Paris, coat and dress

2019, spring–summer 2019
cotton/nylon (tulle), metal, polypropylene (crin), plastic

Purchased with funds from the David Richards Estate, 2020 2020.1.a-b

This dress achieves its exaggerated silhouette using tulle netting and a crinoline underlayer of polypropylene, the world's second most commonly produced plastic. Commercially manufactured since 1957, the synthetic resin is the product of an industrial chemical process called polymerisation, obtained from a gas compound of ethane, propane, butane, naphtha and petroleum. Extruded or moulded, low-cost polypropylene products have contributed to the proliferation of non-biodegradable goods over the last century. Many find their way into landfill and pollute rivers and oceans. Typical of Viktor&Rolf's haute couture, this ensemble demonstrates a technically sophisticated use of textiles and makes a satirical comment on contemporary fashion culture.

Xu Zhen designer
China born 1977

Xu Zhen design studio and manufacturer
China est. 2013

Sofa – Turbulent

2015
polyurethane foam, paint

Purchased with funds donated by Sarah Tiffin and Andrew Clark, 2018 2018.1306

Revealing what is nearly always hidden, this sofa elevates and emphasises polyurethane – the flexible foam that has become one of the most commonly used manufactured materials. Cheap and easy to produce in vast quantiies from a chemical cocktail, polyurethane makes furniture, mattresses and carpet underlay low cost, spongy, durable and supportive. But this seemingly loveable softness belies a more turbulent side. When they degrade, decompose or are burnt, polyurethanes form carbon monoxide, hydrogen cyanide and other toxic products. This is because they are made of isocyanate compounds classified as potential human carcinogens and known to cause cancer in animals. Polyurethane exemplifies the twentieth-century industry and materials – where the true benefits and costs of a material remain unclear.

Jasper Morrison designer
England born 1959

Magis, Torre di Mosto manufacturer
Italy est. 1976

Air chair

1999 designed, 2015 manufactured
polypropylene, glass fibre

Purchased with funds donated by Gordon Moffatt AM, 2017 2016.1040

The *Air chair* by British designer Jasper Morrison was the first polypropylene chair to be manufactured in one piece using gas-injection technology or air-moulding, a process where inert gas is forced into the mould after liquid plastic is injected, pushing the still-molten plastic to the walls. Heralded as an industrial design masterpiece, *Air chair* is exceptionally light and durable; its hollow legs and thin solid seat and back use significantly less material than a regular plastic chair. *Air chair* signalled a new era of designed plastic furniture, where the importance of minimising the quantity of non-biodegradable plastic in the environment has become paramount.

Dirk Vander Kooij designer and maker
the Netherlands born 1983

Endless chair
2010 designed, 2016 manufactured
polycarbonate

Purchased with funds donated by Gordon Moffatt AM, 2017 2016.1046

Dirk Vander Kooij is a Dutch designer who embraces emergent manufacturing technologies and new materials. Working from Zaandam, an old industrial area close to Amsterdam, he produces experimental, limited-edition production objects and furniture designs. *Endless chair* is 3D-printed using polycarbonate reclaimed from the interiors of old refrigerators. Receiving the Dutch Design Award in 2011, *Endless chair* was the designer's first fully resolved piece of furniture using 3D-printing technology. Vander Kooij has become renowned for this process, and his use of large programmable robot arms has enabled a production facility for the twenty-first century.

Jacopo Foggini designer
Italy born 1966

Edra, Pisa manufacturer
Italy est. 1987

Alice armchair

2011 designed, 2016 manufactured
polycarbonate, LEDs, electrical components

Purchased with funds donated by Gordon Moffatt AM, 2017 2017.2

Working in his family's plastic company from a young age, Italian artist and designer Jacopo Foggini discovered a love for experimenting and working with industrial materials, including methacrylate, a material used in the automotive industry to produce headlights. Inventing machines that can heat the material to a temperature required to produce a thread-like filament, Foggini learnt to model luminous design and works of art made by a maze of plastic threads in intertwining colours. *Alice armchair* is composed of one long continuous thread of polycarbonate, applied manually into the mould as if extruded from a tube of paint.

Nike, Beaverton, Oregon

United States est. 1964

Air Jordan Spiz’ike

2011

synthetic fabrics, rubber, plastic

Purchased, 2012 2012.326.a-b

Nike’s iconic Air Jordan sneakers were designed for American basketball player Michael Jordan in 1985, but they were made possible by chemist Charles Goodyear’s accidental invention of vulcanised rubber in 1839. An industrial process for the treatment of natural rubber extracted from trees rich with latex sap, vulcanisation hardens the polymer and increases its durability. Leading to the development of synthetic rubber in 1909, vulcanisation is still considered one of the most significant material inventions of industrialism. Today natural and synthetic rubbers are broadly used in products and goods, from mechanical gaskets to the soles of shoes. *Air Jordan Spiz’ike*, 2011, is the result of a design collaboration with artist and filmmaker Spike Jonze.

...continued overleaf

Maison Martin Margiela

Paris fashion house
France est. 1988

Martin Margiela designer
Belgium born 1957

Helmet bag

2006, 2006–2007 autumn–winter
fibreglass, cotton, metal, leather, plastic, nylon

Gift of Krystyna Campbell-Pretty AM and Family through the Australian Government's Cultural Gift's Program, 2020 2020.602

Helmet bag is made from an upcycled fibreglass motorbike helmet. The helmet part is lined with leather, while the bag's handle makes use of the original nylon chin strap. Motorcycle helmets were first made in fibreglass in the late 1930s when the composite material combining glass, wool and resin was developed as a substitute to moulded plywood. Enabling a strong, thin and lightweight shell construction with elasticity, the invention was widely adopted for its cheap, fast and efficient use in products with aerodynamic bodies including boats, cars and planes. While their manufacture is subject to strict occupational codes, glass-fibre reinforced polymer products remain a problem for the environment.

Balenciaga Paris fashion house
France 1937–1968

Nicolas Ghesquière designer
France born 1971

Sandals

2007 autumn–winter
leather, plastic, metal, rubber, nylon

Purchased NGV Foundation, 2008 2008.1.a-b

Balenciaga's high-heeled sandals, inspired by contemporary snowboarding boots, are a perfect example of the enduring relationship between high heels and material innovation. Historically, high-heeled shoes supported the weight of the wearer using timber and cork. In the 1900s steel was used for the skinny heel of the iconic stiletto, and in the 2000s, with the evolution of technopolymers – plastics with high mechanical properties – the heel was updated once again. Designers like Nicolas Ghesquière continue to use the heel as a means to reveal the enduring relationship between fashion, materials and technology.

Bin Dixon-Ward

England born 1960, arrived Australia 1960

Framework, necklace

2012

nylon, ink

Yvonne Pettengell Bequest, 2014 2014.130

Contemporary Australian jeweller Bin Dixon-Ward explores the possibilities of digital software and 3D printing in nylon to reveal the beauty of complex geometry in her necklace *Framework*. First used in the mass manufacture of the humble toothbrush in the 1930s, synthetic nylon is ideal for 3D printing due to its thermodynamic properties, meaning it can be heated and shaped very effectively. It is often used by artists and designers for prototyping and in small-batch studio productions.

Dale Hardiman designer
Australia born 1990

Adam Lynch designer
Australia born 1991

Dowel Jones design studio and manufacturer
Australia est. 2014

Never grow up, bench

2019
synthetic polymer paint and fibre-tipped pen on European beech (Fagus sylvatica)

Purchased, Victorian Foundation for Living Australian Artists, 2019 2019.863

The graffiti on this bench was carried out by hundreds of people during its presentation at Salone del Mobile, Milan, in 2019. The designers invited audiences to make their mark on the work using acrylic paint pens, to elevate the simple bench design to a form of collective cultural expression. The use of quick drying acrylic paint in art and design gained momentum in the 1960s. Cheaper than oil-based paints, water soluble, plastic polymers presented new possibilities for artists of the Pop movement, including Andy Warhol. Bonding to canvas, wood, metal and most found objects, acrylic paint paved the way for a new era of mixed media art and design.