Large print guide

Natural Dorset

Please do not remove from the gallery and return it back to the holder

Dorset Museum

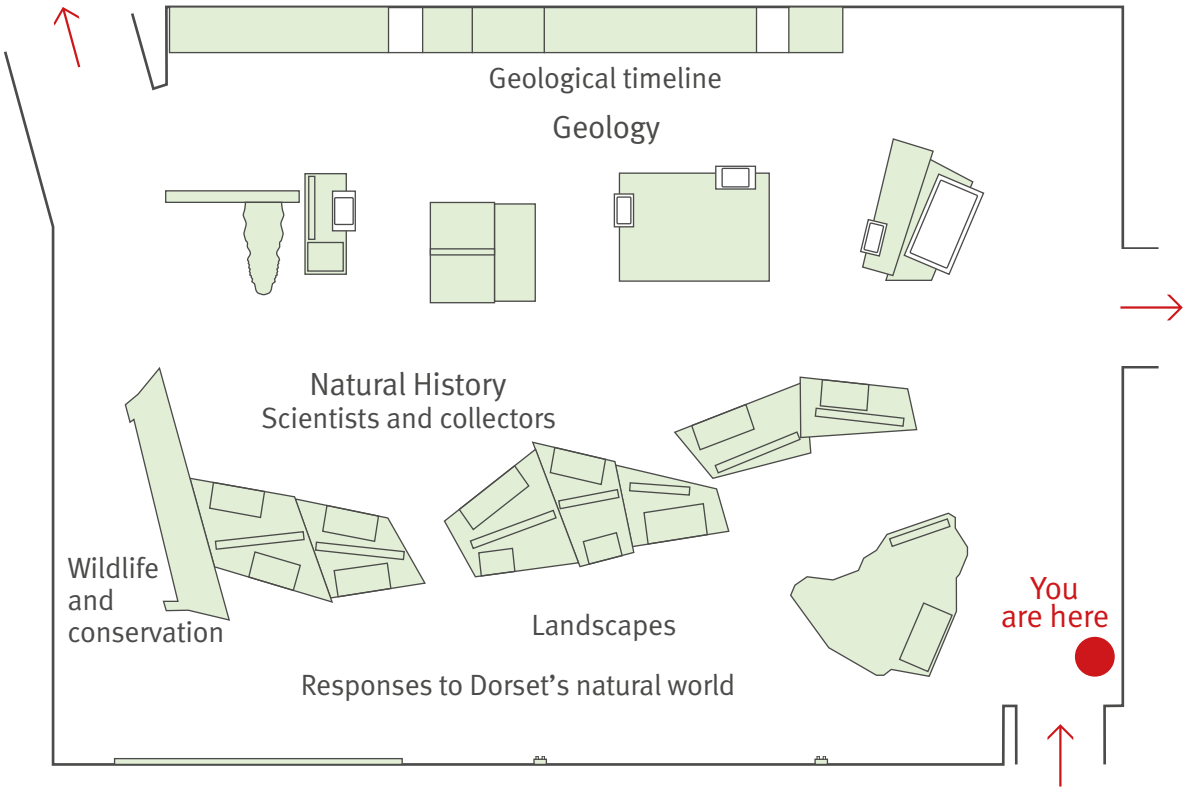
Visitor journey

Hello and welcome to Natural Dorset. This guide will help you navigate around the gallery and contains large print introductory texts and object captions for each of the sections you will pass through.

We apologise if some of the objects have been removed from display or they have changed. Animal specimens can fade if exposed to too much light so we rotate them when required.

Sound point

Please touch

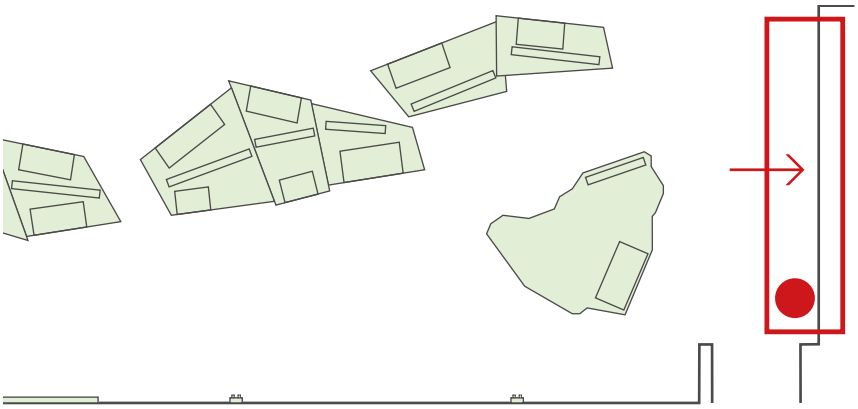


The gallery is divided into three spaces, which are described below:

Geology – Discover the environments and living things that existed around Dorset through geological time, and the evidence for them that is preserved in Dorset's rocks.

Landscapes – Explore the wildlife and habitats that exist in Dorset's diverse, spectacular landscapes.

Conserving and collecting nature – Meet the people who shaped our understanding of Dorset's rich natural history, and learn about the urgency to protect the county's ecosystems.



On the wall (at the start of the gallery):

Natural Dorset

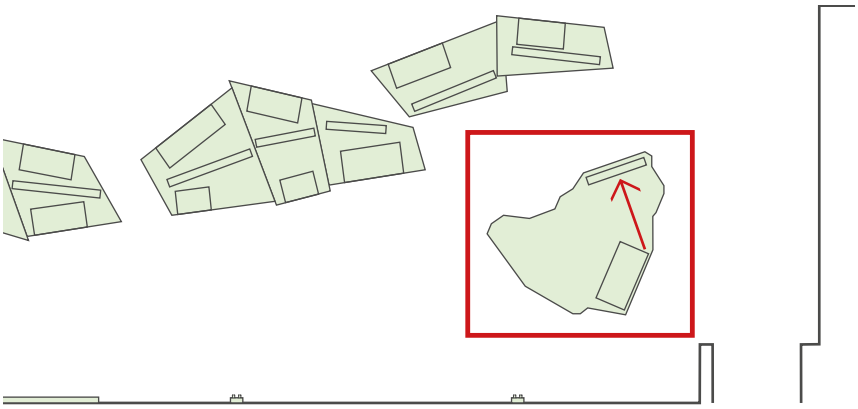
Take a walk on Dorset's wild side, where everything is connected and has an important role – including you.

Think of a delicate Chalk Hill Blue butterfly flitting between wildflowers, a gargantuan dinosaur leaving its mark as a massive muddy footprint, or a scientist discovering an unknown species.

Witness life and habitats evolving together as time passes. Feel the weight of sediments accumulating over millions of years, preserving Dorset's natural history stories in rock layers.

Picture wave upon wave eroding harder and softer rocks into breathtaking headlands and bays, sculpting a beautiful World Heritage Site coastline. Imagine the very first settlers taking advantage of the opportunities of a landscape with no other people in it.

Think of just being here, living, working or unwinding – transforming and being transformed by the rural and urban nature around you. You are a fundamental part of it all. Will you help protect the future of Dorset's rich, life-enhancing natural environments?



On the plinth:

Step back in time

Footprints and many kinds of animal tracks make quite common fossils. Why is this? Every animal has one body that might fossilise, but how many footprints might each animal leave?

Dinosaur footprints (ichnites)

A Swanage dinosaur made these footprints.

The size and depth of these prints and the spacing between them give us clues about the dinosaur's bulk and speed. We can see it had three toes (tridactyl) so it was probably an *Iguanodon* or *Megalosaurus*.

Megalosaurs were big, flesh-eating dinosaurs that walked on their hind legs. Iguanodons ate plants, and could walk on two or four legs. Megalosaurs may have hunted iguanodons. There is no way of telling from the footprints which dinosaur made them.

This trackway formed a small part of an extensive limestone surface covered with 170 dinosaur footprints. It is internationally important because it represents one of the few known examples of earliest Cretaceous dinosaur activity.

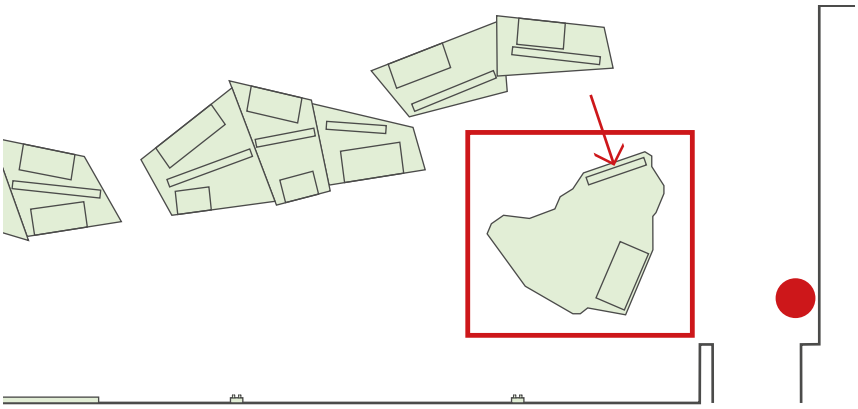
c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.11047

Human footprints set in a floor

People have settled in, used and shaped Dorset's landscape for thousands of years. We know about them from archaeological finds.

These footprints were made in 4th-century Roman Dorchester, when an adult and child walked along the corridor of a house. Its floor was covered by *opus signinum* – similar to plaster – that had not set. Archaeologists have many theories about why the two were crossing an unset floor.

Greyhound Yard, Dorchester
4th century CE
1985.31.43



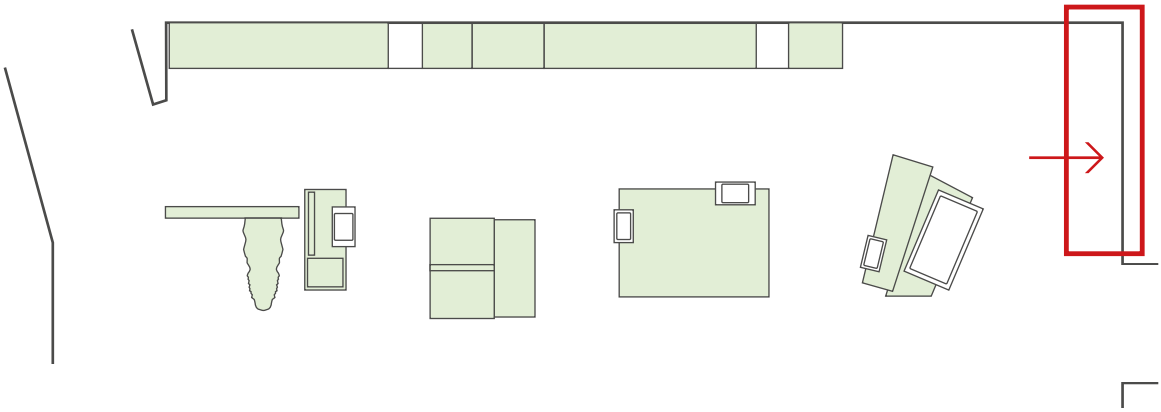
A special landscape

Dorset has spectacular contrasting landscapes, from chalk downland, clay vales, sandstone and limestone hills to heathland over sands and gravels. Half the county is a designated Area of Outstanding Natural Beauty and there are Sites of Special Scientific Interest and Marine Conservation Zones too.

Geology has influenced how people use Dorset's land, because it determines the soil and what grows in it. Over thousands of years people including hunters, farmers and quarry owners have slowly shaped the land, using its resources for food, tools and trade.

Dorset's different landscapes support many kinds of habitats and wildlife. Some have been lost because of urbanisation and more intensive farming and forestry after the Second World War. Climate change has also had an impact. But Dorset is still one of England's most wildlife-rich counties, and the hard work of conservation organisations and members of the farming community is helping some species to recover.

The map shows the main types of rock that lie below the soils around Dorset. These rock types have shaped the county's landscapes and seascapes, and the habitats that have developed within them. Clays have been eroded into gently sloping valleys and lowlands, while harder limestones and sandstones cap Dorset's hills and cliffs.



On the wall:

Top

Geology Panels Triptych no. 2
Life in Purbeck Times

Local animals such as *Iguanodon* are here alongside exotic creatures including *Stegosaurus* and *Archaeopteryx* and all kinds of other life – plants, insects, crustaceans and molluscs. Kenneth Hatts painted these murals four decades before the Jurassic Coast was designated a World Heritage Site.
Kenneth Hatts (1909–2007)
Oil on board
1961–1962
ART.2424.2

Bottom

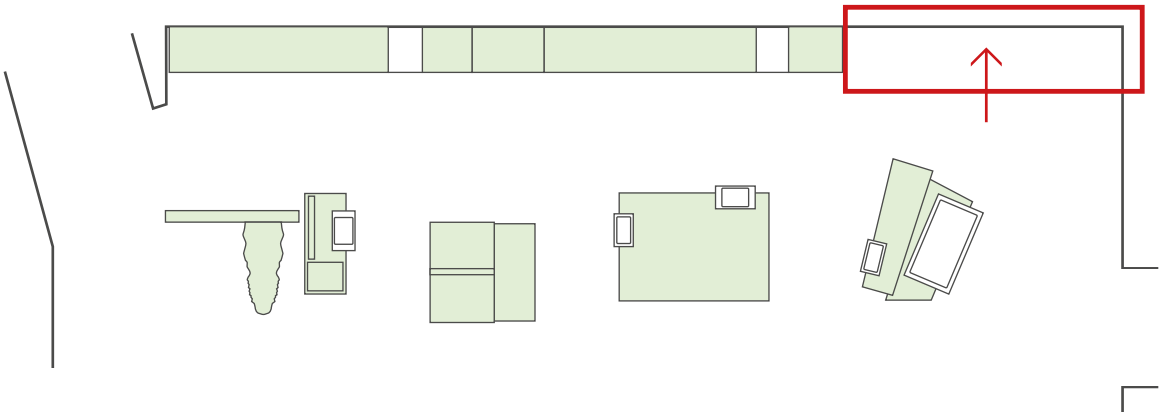
Geology Panels Triptych no. 1
Life in Kimmeridge Times

Dorset's fossils are brought to colourful life in these paintings. They show animal and plant life on land, above water and below water. The artist based them on information from Dorset fossils. Fossils are usually preserved flat and some of the ichthyosaurs, plesiosaurs and fish look squashed, like their fossils.
Kenneth Hatts (1909–2007)
Oil on board
1961–1962
ART.2424.1

Above

Plesoisaur model

If you peek up you'll see a lifesize reconstruction of a plesiosaur, as it would have looked swimming through Dorset's Jurassic seas. Plesiosaurs swam by flapping their four paddle-like limbs. Experiments suggest that this swimming method was not very effective, but it could give plesiosaurs the sudden bursts of acceleration they needed to ambush prey.



On the wall:

How Dorset formed

Dorset's geological story unfolded during the Mesozoic Era, the time of 'middle life', between 252 and 66 million years ago.

The animals roaming, swimming and flying around and the plants growing in the Mesozoic Era were quite different from those that live here now. After they died, their bodies were sometimes buried by sediments. If the ground was sinking, layers of sediments built up over time. Deep under the surface these layers slowly turned into sedimentary rocks.

Sediments did not always build up. At other times, tectonic movements gently compressed, raised and tilted Dorset's rocks. Because of this, many Triassic, Jurassic and Cretaceous rock layers dip gently eastwards. That's why the rocks become progressively younger towards east Dorset.

And the story's not over – landscapes continue to change.

Deep in time

The Earth is 4,600 million years old. That is so mind-boggling that geologists split it into more manageable slices of time called eons. Eons are split into eras, then periods, then epochs.

Life on Earth proliferated during an eon called the Phanerozoic, which is still going on. It spans 541 million years and has three eras: the Palaeozoic, Mesozoic and Cenozoic. The middle one – the Mesozoic – is when many of Dorset's rocks formed.

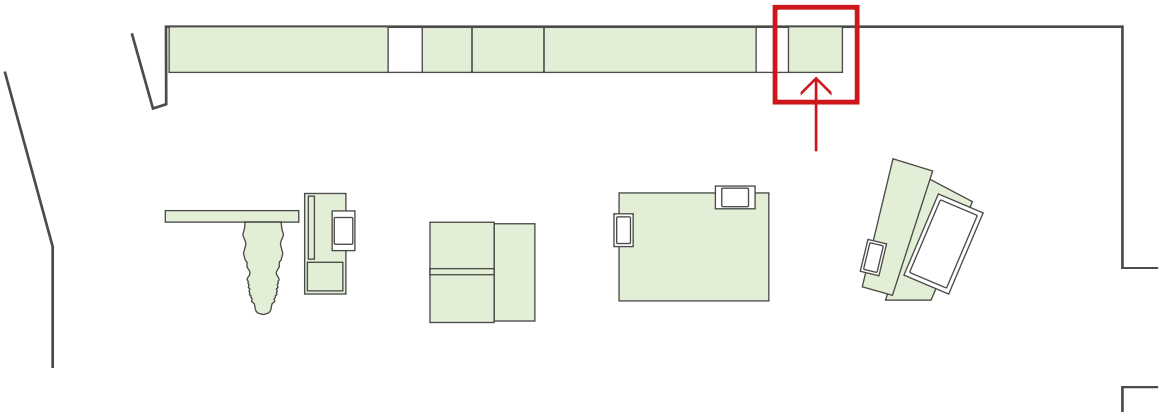
The Mesozoic began after a catastrophic global extinction. It ended with another. Next came an era of familiar life forms – the Cenozoic. There are Cenozoic sediments in east Dorset and there is widespread evidence of late-Cenozoic ice ages in Dorset's landscapes.

Geological timeline

Precambrian: 4600 – 541 mya
Cambrian: 541 – 485 mya
Ordovician: 485 – 444 mya
Silurian: 444 – 419 mya
Devonian: 419 – 359 mya
Carboniferous: 359 – 299 mya
Permian: 299 – 252 mya

Mesozoic Era
Triassic: 252 – 201 mya
Jurassic: 201 – 145 mya
Cretaceous: 145 – 66 mya

Cenozoic Era
Palaeogene: 66 – 23 mya
Neogene: 23 – 2.6 mya
Quaternary: 2.6 mya to present



In the showcase:

Triassic Dorset
252–201 million years ago

Red, hot desert

Dorset was a baking, windswept desert at the start of the Triassic Period. It sat slightly north of the equator within an immense landmass – a supercontinent called Pangaea.

This region was covered by sand dunes and vast salt flats. Great temporary rivers swelled after rain. Fish thrived in wet periods and so did reptiles that scuttled along riverbanks searching for food. Rare fossils of the fish are sometimes found.

The red cliffs of east Devon to the west of Dorset are made up of Triassic rocks. They form the oldest part of the Jurassic Coast. There are no Triassic rocks above ground in Dorset, but there are large areas below ground. Some are reservoirs for oil that formed in Jurassic mudrocks and seeped upwards.

1
Plant root traces

The tube-like shapes in this sandstone show where ancient plant roots once grew.
c.237–247 million years old
Otter Sandstone Formation
Sidmouth, east Devon
G.11708i-ii

2
Drill bit for oil exploration

This is the front section of a drill used to bore into Dorset's rocks in the early 1980s. The drilling was part of exploration work to look for crude oil. Dorset oil is held inside porous Triassic sandstones and trapped beneath impermeable rocks that stop it rising, as oil usually does.
Late 20th century
G.7773

3
Mudstone

Mud from rivers settled out in expanses of lakes, floodplains and mudflats to form deposits like this.
c.202–237 million years old
Mercia Mudstone Group
West of Seaton, east Devon
G.11710

4
Amphibian (Labyrinthodontia, unknown species)

This collarbone fragment is from an amphibian – a frog and newt relative – called a labyrinthodont. They ambushed their prey in a similar way to crocodiles and were an important group before the dinosaurs. Labyrinthodont means labyrinth-toothed – a cross-section of their complex tooth structure looks like a maze.
c.237–247 million years old
Otter Sandstone Formation
Sidmouth, east Devon
On loan from Royal Albert Memorial Museum and Art Gallery
LI.2020.3

Gypsum

As saline pools dried in the Triassic sun, salts made of calcium sulphate crystallised out of them. Sediment buried the salts deep in the ground. Where sediment above eroded, water reached the salts and changed them into gypsum – finely crystalline (6) or fibrous crystals (7) depending on how quickly they absorbed water.

5
Gypsum var. alabaster ($CaSO_4 \cdot 2H_2O$)
Probably c.202–237 million years old
Probably Mercia Mudstone Group
Borehole near Lyme Regis, west Dorset
G.1363

6

Gypsum var. satin spar ($CaSO_4 \cdot 2H_2O$)
Probably c.202–237 million years old
Probably Mercia Mudstone Group
Borehole near Lyme Regis, west Dorset (G.1358);
Dunscombe, southeast Devon (G.11701i-ii)
G.1358 and G.11701i-ii

7

Clay-like mineral [Palygorskite $(Mg,Al)_2Si_4O_{10}(OH) \cdot 4(H_2O)$]

Fossils aren't the only things that can give us clues about past environments. Minerals can too. Fibrous, clay-like palygorskite forms today in semi-arid climates – those with around a third of Britain's annual rainfall. This Triassic palygorskite probably formed in similar conditions, perhaps in a temporary lake or desert soil.
c.202–237 million years old
Mercia Mudstone Group
Seaton, east Devon
G.5492 and G.11712

8
Pebbles

These pebbles are some of the oldest things in the Museum. They come from east Devon's cliffs where there is a 30-metre-thick layer of pebbles dating back to the earliest Triassic. This layer formed in a huge northeast-flowing braided river. The pebbles were eroded from much older rocks in northern France.
c.247–251 million years old
Chester Formation
Various localities, east Devon
G.11700i-v and G.5475

9
Brachiopods in orthoquartzite pebble with French source

Budleigh Salterton's red cliffs contain pebbles that were eroded during the Triassic from much older rocks – up to nearly 500 million years old. They can be dated by the fossils in them, such as these shellfish (brachiopods). Budleigh Salterton is in a protected Site of Special Scientific Interest.
c.247–251 million years old (deposit containing pebble)
Chester Formation
Budleigh Salterton, east Devon
G.5477

10
Fossiliferous mudstone with *Rhaetavicula contorta*

Can you see aquatic animal bones and teeth, and brachiopod shellfish in this end-Triassic lagoon mudstone? The lowlands where river sediment ended up were better at supporting and fossilising life than Triassic deserts.
c.201–208 million years old
Penarth Group
Culverhole Point and Pinhay Bay, east Devon
G.1367, G.1368, G.5488 and G.5490

In the drawer:

What on earth were rhynchosaurs?

Rhynchosaur fossils are among the oldest in the gallery. They come from Triassic animals with wide heads and beak-like noses and mouths. We would find them very strange but they did have things in common with animals we know – they were reptiles, like dinosaurs and crocodiles.

Unlike crocodiles they ate plants, which were also very different to plants today. Rhynchosaurs did well in the Triassic and lived around the world, but did not survive into the Jurassic Period.

Rhynchosaur (*Fodonyx spenceri*)

Rhynchosaur means snout-lizard. Their triangular heads narrowed to snouts ending with curved upper front teeth. These features helped them cut through tough foliage and are the reason they are sometimes called parrot-beaked reptiles. Here are some rare examples of Jurassic Coast rhynchosaur bone fossils. Can you spot a jawbone with teeth?
c.242–247 million years old
Helsby Sandstone Formation
Near Sidmouth, east Devon

On loan from Royal Albert Memorial Museum and Art Gallery
LI.2020.3

In the drawer:

Holotypes – what's in a name?

Holotypes are as important as fossils can be. Each holotype in this drawer is the single fossil that the description and name of its species is based on. That means each one is the most characteristic fossil of its type.

There is only one holotype for each species, but there can be many other type specimens. If you have a fossil and want to know what species it is, you can compare it with type specimens here and at other museums.

Dinosaur (*Nuthetes destructor*), holotype

This tiny lower jaw comes from a dinosaur whose conical teeth curved toward the back of its mouth to help it swallow squirming prey. It is the first raptor dinosaur fossil ever found in Britain. It belonged to *Nuthetes*, which was a small dromaeosaur – a group that also included velociraptors.
c.142 million years old
Purbeck Group
Durlston Bay, southeast Dorset
G.913

Turtle skull (*Dorsetochelys delairi*), holotype

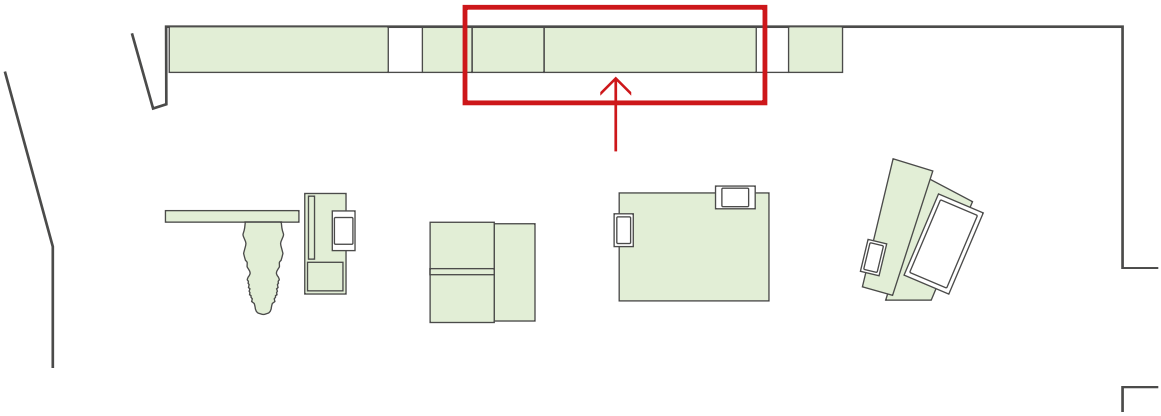
This turtle skull was named *Dorsetochelys* to celebrate its discovery in Dorset. Fossils of the same kind of freshwater turtle have been found in Germany. Perhaps expanses of freshwater sometimes linked the two areas, so the turtles could migrate between them.
c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.23

Ammonite (*Aulacostephanus* [*Aulacostephanoceras*] *undorae*), holotype

Fossils are grouped into types with similar characteristics. These characteristics are described and pictured when a species is named in scientific texts. This ammonite species is characterised by a tightly-coiled shell with ribs which split into two.
c.155 million years old
Kimmeridge Clay Formation
Osmington, south Dorset
G.4245

Ammonite (*Reineckia* [*Reineckeites*] *duplex*), holotype

Sydney Savory Buckman (1860–1929), a geologist, identified this ammonite as a new species and named it, along with lots of others. Dorset Museum looks after several types of shellfish whose species were named by Buckman.
c.160 million years old
Oxford Clay Formation
Weymouth, south Dorset
G.2946



In the showcase:

Jurassic Dorset
201–145 million years ago

Rising and retreating seas

Dorset's World Heritage Site, the Jurassic Coast, is named after this period when a remarkable wealth of life thrived.

Through Triassic and into Jurassic times, Dorset drifted north within its supercontinent, Pangaea. Then Pangaea's western region split and an early Atlantic ocean opened. Dorset was flooded by a warm sea teaming with life, where muds, limestones and sands collected. These can be seen today in Dorset's quarries and in west Dorset's famously fossil-rich cliffs.

The ground beneath Dorset mostly sank throughout the Jurassic, but its seas repeatedly shallowed and deepened. As a result, cycles of muds, sands and limestones built up. Many of these give us invaluable glimpses of how Dorset life developed. As the Jurassic ended, the sea retreated and lagoons formed. Strongly seasonal climates created challenges for life.

Below

Ichthyosaur (*Leptonectes tenuirostris*)

Ichthyosaurs had long, thin jaws. Less than a third of this animal's snout is preserved so you can't see its full range of small, sharp teeth. Scientists have counted 140 in the lower jaw of this species. They helped the ichthyosaurs catch and dismember fish.
c.195 million years old
Lias Group
Lyme Regis, west Dorset
G.4

Below right

Model of a pliosaur

Short-necked plesiosaurs called pliosaurs were the top Jurassic sea predators. Unlike long-necked plesiosaurs, pliosaurs had massive heads and throats – all the better to eat with. This model's makers imagined its colour patterns by looking at today's marine predators, such as sharks, for clues.

Below left

Model of a plesiosaur

Plesiosaurs breathed air like all reptiles, but their necks weren't designed to hold their heads high above the water. A wealth of plesiosaur material has been discovered in the coastal limestones and mudstones around west Dorset. Plesiosaur

fossils are much rarer than ichthyosaur fossils along the Jurassic Coast though.

Right

Ichthyosaur (*Ichthyosaurus communis*)

This once speedy young ichthyosaur is beautifully preserved and is only missing the tips of its jaw and tail. Its backbones (vertebrae) were distorted as sediments squashed its buried body. Ichthyosaurs were viviparous reptiles. That means this animal developed inside its mother, who gave birth to it rather than laying eggs.
c.185 million years old
Lias Group
Probably Lyme Regis, southwest Dorset
G.10741

Left

Plesiosaur vertebra (possibly *Plesiosaurus colymbosaurus*)

Only a huge animal could have a backbone (vertebra) this big. This one belonged to a plesiosaur around eight metres long. It has been preserved so well that you can still see the arch the spinal cord ran through and its bony projections. Powerful muscles would have attached to these projections, to help the plesiosaur flex.
c.155 million years old
Kimmeridge Clay Formation
Near Corfe Castle, southeast Dorset
G.172

Above

Pliosaur paddle (*Pliosaurus macromerus*)
Pliosaurs swam along using four powerful paddles. They manoeuvred each one deftly to direct and propel themselves through the water. This is one of the front paddles of a big pliosaur that was about the same size as the owner of the skull behind you.
c.155 million years old
Kimmeridge Clay Formation
Kimmeridge, southeast Dorset
G.123

Right

Plesiosaur vertebrae (*Muraenosaurus* sp.)

Fossils are often found broken into pieces, which can be difficult to arrange back together. It is even trickier if they have been separated or mixed with pieces from other organisms. Perfectly intact specimens are extremely rare, but are crucial for understanding which species fragments like these belong to.
c.155 million years old
Kimmeridge Clay Formation
Kimmeridge Bay, southeast Dorset
G.2653

1

Ammonite (*Asteroceras* sp.)

The first part of this ammonite's name, aster, means star.
c.190–195 million years old
Lias Group
Near Charmouth, west Dorset
G.1170

2

Ammonite (*Stephanoceras humphriesianum*)

Some fossils from this ammonite group are large, like this one, but others are smaller. Because there are two distinct sizes rather than a variation, it is likely that they represent smaller males and larger, egg-bearing females.
c.166–174 million years old
Inferior Oolite Formation
Near Sherborne, north Dorset
G.15347
Donated by John Whicher and Robert Chandler, prepared by John Whicher

3
***Nautilus* sp.**

Nautiluses like this one have a lot in common with ammonites. But unlike these close relatives, some types of nautilus are still alive today.
c.166–174 million years old
Inferior Oolite Formation
Near Uploders, southwest Dorset
G.516

4
Fish (*Dapedium* sp.)

Thick scales and bony skull-plates protected this fish from predators.
c.195–200 million years old
Lias Group
Lyme Regis, west Dorset
G.200

5
Ammonite (possibly *Glaucolithites* sp.)

Giant squid and the giant Pacific octopus live in our oceans today. There were ammonite giants swimming through Dorset's seas near the end of the Jurassic Period too.
c.145–152 million years old
Portland Limestone Group
Osmington, south Dorset
G.6258

6
Belemnite (*Conoteuthis* sp.)

Belemnite shells like this were made up of fine, alternating layers of inorganic and organic materials. These split light into rainbow colours, creating iridescence.
c.190–201 million years old
Lias Group
Lyme Regis, west Dorset
G.1207

7
Model of an ammonite

Ammonites swam through Earth's oceans for around 450 million years, and the Jurassic Coast is famous for their fossils.

8
Ammonite (unknown species)

When this ammonite died its rotting organic remains released sulphur, which combined with iron from seawater. This crystallised around its shell and chamber walls, forming fool's gold (pyrite). Creamy brown calcite crystals fill the centres of some chambers.
c.195 million years old
Lias Group
Probably southwest Dorset
G.1251

9
Ammonites, belemnites, bivalves and gastropods, various species

If you had been swimming through Dorset's Middle Jurassic sea and looked down through its warm clear water, you might have noticed shell collections like this on the seafloor.
c.166–174 million years old
Inferior Oolite Formation
Near Sherborne, north Dorset
G.15348
Donated by John Whicher and Robert Chandler, prepared by John Whicher

10
Crinoid (*Pentacrinites* sp.)

Crinoids are animals that look a bit like plants. They filter-feed tiny particles out of seawater. This type lived attached to driftwood floating through Jurassic seas. When the wood became waterlogged, it sank to the seafloor with its crinoid residents and was buried by mud.
c.192–199 million years old
Lias Group
Probably near Charmouth, southwest Dorset
G.1229

11
Dinosaur (*Scelidosaurus harrisonii*)

Here are three beautifully preserved backbones (vertebrae). Each still has one of its original processes – bony projections that muscles and ligaments attached to. These backbones belonged to a local plant-eating dinosaur, *Scelidosaurus*. Adults were up to four metres long, with protective plates.
c.189 million years old
Lias Group
West of Seatown, southwest Dorset
G.7842

12
Model of a scelidosaur

13
Carbonised wood (unknown species)

This is like the jet found around Whitby, northeast England, which also formed from wood. Dorset's fossil wood crumbles more easily, though.
c.155 million years old
Kimmeridge Clay Formation
Ringstead, south Dorset
G.5961

14
Model of a megalosaur

Real megalosaurs were fearsome predators forty times the size of this.

15
Dinosaur (Theropoda, probably megalosaurid)

This fossil dates from a time when megalosaurs are thought to have become extinct. The animal probably belonged to the family of large carnivorous dinosaurs that megalosaurs were part of.
c.155 million years old
Kimmeridge Clay Formation
Lyme Bay, south of Dorset
G.10603

16
Models of a pterosaurs

Pterosaurs were the first vertebrates to master true flight. They could launch themselves skilfully from the ground rather than treetops.

17
Pterosaur (*Dimorphodon macronyx*), reproduction of original

Unlike today's birds, flying reptiles called pterosaurs had teeth.
c.198 million years old
Lias Group
Charmouth, west Dorset
G.87

18
Belemnite with ink sac (unknown species)

Next to this belemnite shell (guard) is something that is hardy ever preserved – an ink sac.
c.195 million years old
Lias Group
Seatown, southwest Dorset
G.1214

19
Bivalve (*Valata anglica*)

This is an extremely rare bivalve species.
c.160 million years old
Corallian Group
Wyke Regis, south Dorset
G.11653

20
Coral (*Isastraea oblonga*)

This fossil is from a colony of genetically identical coral polyps.
c.150 million years old
Portland Limestone Group
Portland, south Dorset
G.6234

21
Sea urchins (*Pygurus michelini*)

These sea urchins share a symmetry with many of their starfish relatives – like that of a five-sided star.
c.166 million years old
Cornbrash Formation
Shipton Gorge and Swyre, southwest Dorset
G.2413 and G.2424

22
Ammonite (*Dactylioceras* sp.)

Dactylioceras was among the most successful of all ammonite types.
c.181 million years old
Lias Group
Seatown, southwest Dorset
G.14398

23
Snails and bivalves (*Aptyxiella portlandicum* and *Myophorella* sp.)

These are casts of shells' insides.
c.150 million years old
Portland Limestone Group
Portland, south Dorset
G.6226

24
Lobster (*Pustulina perroni*)

This extinct little lobster looked a bit like today's crayfish.
c.155 million years old
Kimmeridge Clay Formation
Ringstead, south Dorset
G.5964

25
Brittle star (*Palaeocoma egertoni*)

Many brittle stars have several legs trailing in one direction, probably showing the direction of an ancient storm current.
c.185–188 million years old
Lias Group
Seatown, southwest Dorset
G.1244

26
Bivalve (*Cucullaea oblongus*)

Modern shells often have alternating coloured stripes that are added with age, like tree-rings. These may represent yearly cycles in seawater chemistry or the shellfishes' diets. Original fossil banding is rare and the colours of these bands have probably changed.
c.170 million years old
Inferior Oolite Formation
Sherborne, north Dorset
G.1712

27
Brachiopods (*Kallirhynchia multicosta*)

This type of brachiopod shellfish had V-shaped ribbing that probably helped regulate water flow between its shells.
c.166 million years old
Cornbrash Formation
Nottington, south Dorset
G.4893-G.4895

28
Brachiopods (*Sphaeroidothyris* sp.)

Brachiopods look like bivalves but are not closely related.
c.167 million years old
Fuller's Earth Formation
Vinney Cross, southwest Dorset
G.6336-G.6337 and G.6340

29
Bivalve (*Deltoidium delta*)

The element phosphorous is an essential nutrient in animals' diets, including ours. If you look at this oyster shell's tip (hinge), you can see a mineral containing phosphorous. It was released as the oyster's body decayed. Can you spot a scar where one of the animal's muscles attached to its shell?
c.160 million years old
Corallian Group
Ringstead, south Dorset
G.11686

In the drawer:

Why do living things evolve?

All life is connected in a family tree. It grew from the earliest microorganisms that colonised our planet.

Life is so diverse today because of the ways organisms developed from their ancestors to become better suited to their environments.

All members of a species share common characteristics, but none are exactly the same. If one member has a trait that helps it compete for resources, it is more likely to survive and pass this trait on to any offspring. Here is an example of fish evolution.

Fishing for fossil facts

Fish have two types of skeleton – cartilage or bone. Fish with cartilage skeletons include sharks and rays. Some Mesozoic bony fish developed enamelled scales, but these made it more difficult to move. Few fish have hard scales today, suggesting that designs enabling speed and agility help them survive.

Fish with a bone skeleton, protective diamond-shaped scales and peg-like grinding teeth.

1
Lepidotes minor

c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.275

2
***Lepidotes minor* left dentary**

c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.6313

Shark with a cartilage skeleton and protective spines on its back, in front of each dorsal fin.

3
***Hybodus* sp. dorsal fin spine**

c.142 million years old
Purbeck Group
Unknown location, probably southeast Dorset
G.6305

4
***Hybodus* sp. ripping teeth, located around the front of the shark's mouth**

c.142 million years old
Purbeck Group
Unknown location, probably southeast Dorset
G.6312

5
***Hybodus* sp. crushing teeth, located around the back of the shark's mouth**

c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.6299

In the drawer:

Marking time

Each of these ammonites is a guide fossil. A guide fossil is a species that lived over a particular time period. If the same guide fossils are found in different places we know that the rocks at both sites are about the same age.

Through time and space

Here are three examples of guide fossil ammonites that help us compare the ages of rocks around Dorset. All three ammonites are found in rock layers between Burton Bradstock, southwest Dorset, and near Sherborne, north Dorset. As this diagram shows, ammonite 1 is the youngest and is found in higher rocks, ammonite 2 is in the middle and ammonite 3 is the oldest, found in lower rocks. Because sediment accumulated more quickly at Sherborne, the ammonites are found in greater thicknesses of rock there.

1
Parkinsonia bradstockensis

c.172 million years old
Inferior Oolite Formation
Burton Bradstock, south Dorset
G.15349

2
Sonninia* (*Euhoploceras*) *marginata

c.174 million years old
Inferior Oolite Formation
Sherborne, north Dorset
G.15350

3
Graphoceras concavum

c.175 million years old
Inferior Oolite Formation
Near Beaminster, west Dorset
G.15351
Donated by Robert Chandler

In the drawer:

Gone without a trace?

There are two types of fossils. Body fossils come from the bodies of animals or plants. Trace fossils show what animals left behind – the traces of their activities like footprints, burrows and droppings.

Body fossils

Snail body fossils (*Pleurotomaria* sp.)

These are two fossils of the same type of snail, but they have been preserved in different ways. The left snail still has its shell, but the right fossil is an internal cast, made by sediment filling a shell that has since dissolved away.

Left: c.158 million years old
Corallian Group
Unknown location, probably, Dorset
G.4722

Right: c.155 million years old
Kimmeridge Clay Formation
Osmington, south Dorset
G.5586

Clam body fossil (*Pholadomya* sp.) with burrow trace fossil

Here is a body and trace fossil in one – a clam (bivalve) fossilised with part of its burrow directly above it. The clam buried itself within a muddy seabed, and this increased its chances of being fossilised.
c.105–112 million years old
Gault Formation
Evershot, northwest Dorset
G.12742

Trace fossils

Burrow trace fossil (*Imbrichnus* sp.)

This burrow was made by an invertebrate – an animal without a backbone – probably when it was looking for food.
c.166–168 million years old
Forest Marble Formation
Near Bridport, southwest Dorset
G.9781

Poo trace fossil (coprolite)

The shape and fish-scale contents of this lump reveal it to be poo that was dropped by a fish-eating reptile – perhaps an ichthyosaur or plesiosaur – and turned to stone.
c.190–195 million years old
Lias Group
Charmouth, west Dorset
G.1434

In the drawer:

Rock and fossil hunting heaven

If you love exploring the Jurassic Coast, you're not alone. Scientists have dug and discovered here for over 300 years, attracted by the number and quality of its fossils and the beautiful landforms. Many of their discoveries shook the scientific community and changed the way we understand past life.

1
Leaflet for a lantern lecture

Cyril Day (1885–1968) was a busy man. A physician by profession, he spent much of his spare time investigating Dorset's geology and natural history. This leaflet invited people to his slideshow lecture about the Dorset coastline's land and seascapes.
1921
NHMSXXIII.5.b

2
Photograph of Rocket Quarry, Portesham, south Dorset

Quarry workers sometimes found strange and fascinating fossils when removing rocks. Here, two young friends play on a large fossil of algae that grew around an ancient tree.
GT Watts
1933
P.8146

3
Osmington (south Dorset) field memoir by WJ Arkell

Geologist and fossil collector William Arkell (1904–1958) was perhaps the most important Jurassic Period expert of the mid twentieth century. As a child he fell in love with the countryside and his enthusiasm for exploring nature never left him.
1951
2020.26.1

On the wall:

Left

Fossilised conifer tree trunk (*Protocupressinoxylon purbeckensis*)

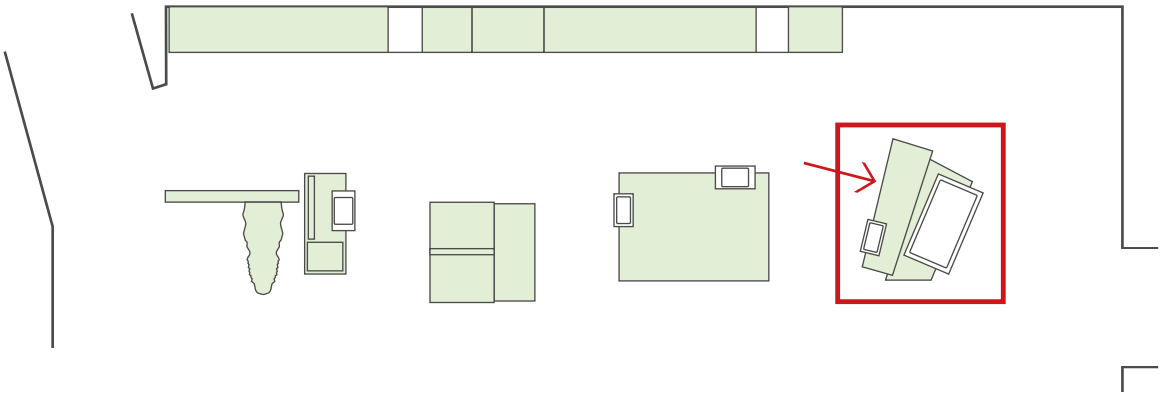
As the Jurassic Period gave way to the Cretaceous, forests of towering, cypress-like trees grew around Portland and Purbeck.

The semi-arid climate was strongly seasonal. Few organisms could survive, but these well-adapted trees flourished alongside other seed-bearing plants and ferns. Flowering plants had yet to evolve.

As the dry seasons progressed, water in soils and lagoons became rich in dissolved silica. This silica turned some trees to stone before they decayed or were compressed. Sometimes lagoons flooded and drowned forests. Thick clots of algae grew over fallen trees and stumps. It trapped carbonate-rich mud, which hardened into limestone in doughnut shapes that you can still see today.

Fossils of these trees near Lulworth are the world's most complete forest record of that time. This one was so tall that we need to display it in sections.

c.140 million years old
Purbeck Group
Trade Quarry, Portland, Dorset
G.6688



On the plinth:

Please touch

These are real fossils. Touch them to explore their shapes and get closer to the stories behind them.

Ammonites (*Graphoceras* sp.) and bivalves

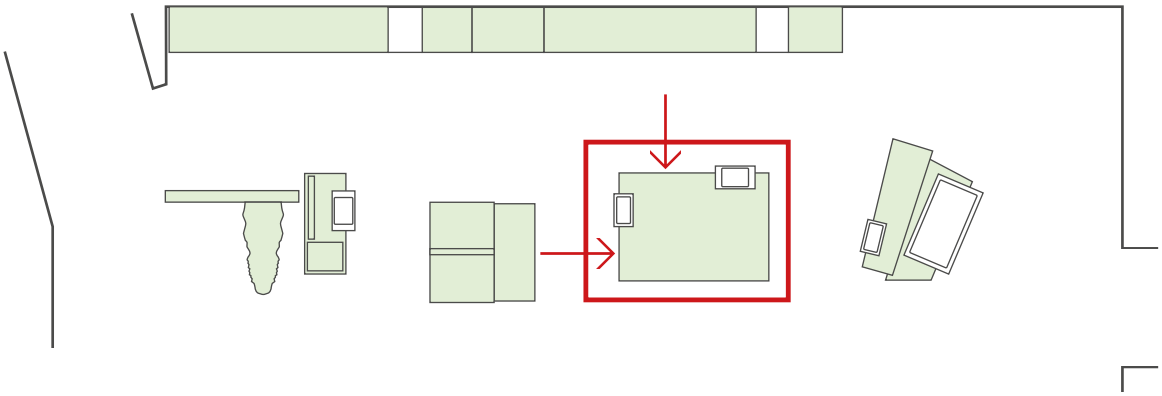
The ammonites, bivalves and sand in this specimen are held together by limestone that crystallised out of tropical seawater. Feel the differences between fragments of coiled ammonites and two-shelled, straight-ribbed bivalves, and the sandy limestone.
c.166–174 million years old
Inferior Oolite Formation
Bradford Abbas, north Dorset

Donated by John Whicher and Robert Chandler, prepared by John Whicher

Ammonite (*Stephanoceras* sp.) with belemnites

The shellfish in this specimen died and sank to the seabed, where their soft bodies were scavenged and rotted. Some of the ammonite's flat, spiralling shell was lost before sediment buried it. Can you feel where parts are missing?
c.168–171 million years old
Inferior Oolite Formation
Oborne, north Dorset

Donated by John Whicher and Robert Chandler, prepared by John Whicher



On the plinth:

The Weymouth Bay pliosaur (*Pliosaurus kevani*), holotype

Dorset's warm Jurassic sea was once the hunting ground of this supremely ferocious predator.

These fearsome-looking jaws had a bite power to rival the greatest predators in our planet's history – and were perfectly adapted to dismembering large prey. They belonged to a type of air-breathing sea reptile known as a pliosaur, which lived around 155 million years ago towards the end of the Jurassic Period. This exceptionally preserved skull is 2.4 metres long, and is the world's largest substantially complete pliosaur skull found so far. Its body would have been nearly 18 metres long and 10 metres wide, paddle tip to paddle tip.

It was named *Pliosaurus kevani* after Kevan Sheehan. He found sections of the skull along Weymouth Bay's coast and continued collecting pieces over many years.

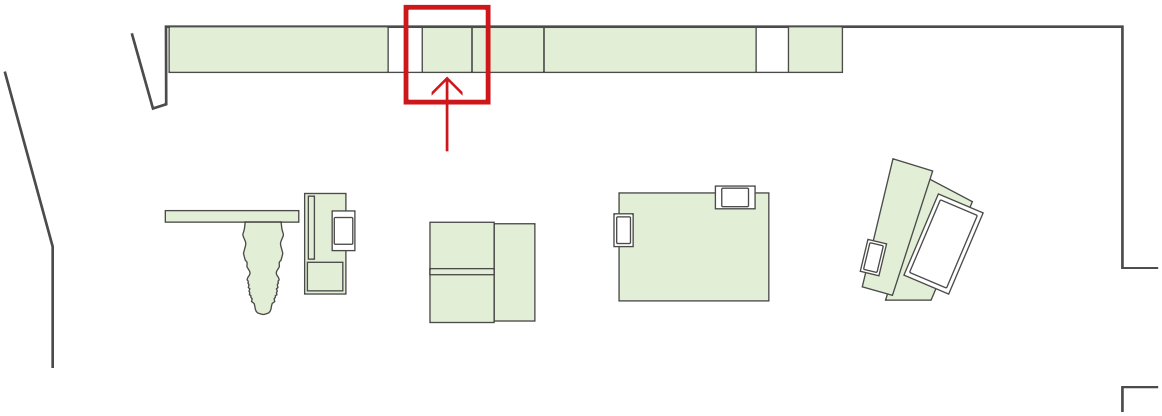
c.155 million years old
Kimmeridge Clay Formation
Weymouth Bay, Dorset
G.13675

Sense and sensitivity

How did this hunter find prey in the murky, muddy seawater? Scans show that holes around its snout and near its teeth are the ends of networks running through its jaws to its brain region. These formed a sensory system that could detect movement, chemicals, temperature changes and/or electric pulses, all signs of potential meals.

A pliosaur's skull was surprisingly weak – thrashing about crocodile-style with prey would have injured this animal. Its muscles didn't supply much bite-power to the front of its jaws, but its bite-force at the back matched that of *Tyrannosaurus*. Victims were probably dispatched towards its throat, chomped and swallowed.

Sound point:



In the showcase:

Cretaceous Dorset
145–66 million years ago

Feeling the heat

Dinosaurs roamed Early Cretaceous forested islands that fringed lagoons fed by rivers. Dorset moved north, but got hotter in an extreme greenhouse climate. Tectonic movements tilted the region's rocks, creating an eastward dip, and exposed rocks eroded away.

Around 125 million years ago, seas flooded the eroded land. Muds and greenish sands accumulated. Then for 30 million years, billions of minuscule algal skeletons amassed upon the floors of open seas. These later became the White Chalk Subgroup. The Cretaceous ended with cataclysmic global extinctions.

Above

Model of a sauropod

Sauropods were huge four-legged plant-eaters that measured up to 25 metres. They had long tails and necks and surprisingly little heads. Their torsos were long too,

and their stomachs enormous. They needed legs like pillars to support their bulky bodies. There must have been plenty of Purbeck plants to fill them.

Above

Sauropod metacarpal (unknown species)

Sauropods were the biggest land animals ever. It wouldn't be easy to fit one in this gallery, but here is a sauropod front foot bone (metacarpal). An unbroken one would be about 35 centimetres long. This is the first sauropod bone discovered in Purbeck, although Purbeck Group sauropod footprints had been found earlier.
c.142 million years old
Purbeck Group
Portland, south Dorset
G.12969

1
Cycad (probably *Cycadeoidea* sp.)

A Cretaceous soil on Portland has fossilised a forest, which includes stems like this one. Fern-like leaf fronds grew from the stems' diamond-shaped scars. We call these fossils cycads. The plants they came from are now extinct. They grew to look like modern cycad plants, but had different reproductive and leaf structures.
c.140 million years old
Purbeck Group
Isle of Purbeck, southeast Dorset
G.6687

2
Dinosaur footprint (*Megalosaurus* sp.)

A large meat-eating dinosaur called a meglosaur made this print. Dinosaurs are split into two types – lizard-hipped (like megalosaurs) and bird-hipped. Strangely birds evolved from lizard-hipped dinosaurs. Bird-like pelvises evolved independently in two different dinosaur groups. This is known as convergent evolution.
c.142 million years old
Purbeck Group
Near Swanage, southeast Dorset
G.126

3
Imprints of salt crystals (halite pseudomorphs)

The type of salt we sprinkle on chips can crystallise out of seawater pools in dry climates, when intense evaporation concentrates salts in the water. Salt crystals readily dissolve again when they are in less briny water. These cubes formed when salt crystals dissolved and mud filled the spaces they left.
c.142 million years old
Purbeck Group
Lulworth, southeast Dorset
G.11662

4
Bivalves (*Unio* sp.)

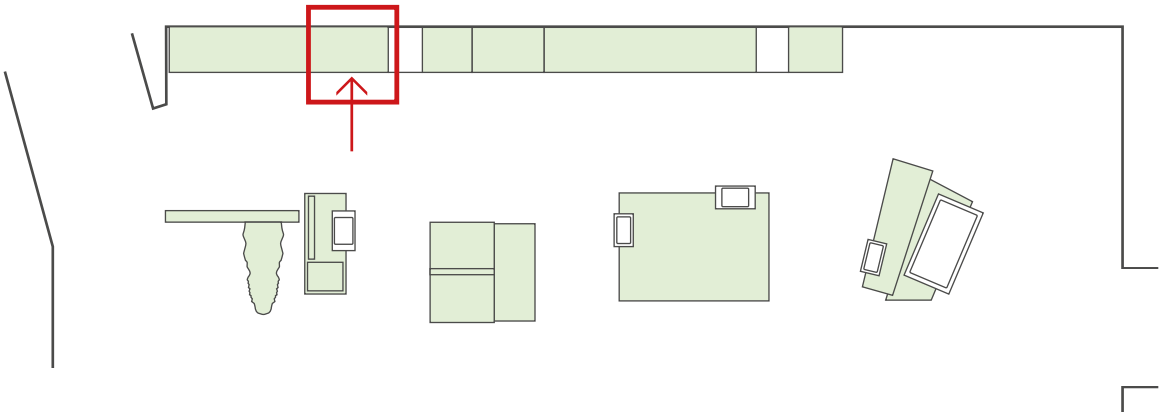
These fossil shellfish were freshwater mussels, but the green colour of the rock around them comes from a mineral called glauconite, which forms under the sea. How did that happen? One theory is that the green mineral was eroded from rocks formed under the sea, then redeposited in a lakebed or riverbed.
c.140 million years old
Purbeck Group
Lulworth, southeast Dorset
G.6413

5
Snails (*Viviparus cariniferus*)

Gastropods are snails. Their name means stomach foot – a wonderful way to sum them up. The snails packed into this limestone give it the decorative quality that led to it being called Purbeck marble. Tremendous numbers of these little gastropods lived in freshwater ponds behind an Early Cretaceous Purbeck shoreline.
c.140 million years old
Purbeck Group
Isle of Purbeck, southeast Dorset
G.6487

6
Reptile (*Opisthias* sp.)

The reptile that opened this jaw to eat was a sphenodont. They were common in the Triassic Period and similar to the lizards that ultimately outcompeted them. Cretaceous sphenodonts are mostly found in North America. Some Early Cretaceous USA and Purbeck fossil communities are alike, suggesting that animals moved between the two regions.
c.140–145 million years old
Purbeck Group
Durlston Bay, southeast Dorset
G.10831



In the showcase:

Cretaceous Dorset
145–66 million years ago

1
Fish (*Histionotus angularis* and *Lepidotes minor*)

There are fish fossils galore in this rock. It was collected in 19th-century Dorset by one of the Museum's founders – John Clavell Mansel-Pleydell (1817–1902). He was fascinated by many aspects of Dorset's natural world and collected avidly. You can find out more about Mansel-Pleydell in a display behind you.
c.140–142 million years old
Purbeck Group
Near Swanage, southeast Dorset
G.325

2
Fish (*Pholidophorus granulatus*)

Around 96 per cent of modern fish species belong to the same class of fish as this fossil. That class is called 'ray-finned' because the fishes' webbed fins are supported by spines (rays). They can pump water through their gills and so breathe without swimming. This example was a speedy hunter.
c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.320

3
Fish (*Aspidorhynchus fisheri*), type specimen

This distinctively long and slender fish had an upper jaw that was longer than its lower jaw and tapered to a spike. It was a fast swimmer and may have used the spike to jab and injure prey it ambushed. The fish's name – *Aspidorhynchus* – means shield snout, even though there is no shield.
c.141–142 million years old
Purbeck Group
Swanage, southeast Dorset
G.322

4
Crocodilia (*Pholidosaurus purbeckensis*), holotype

The tip of this crocodilian's snout is missing but we know it was long, like those of many other crocodilians, such as crocodiles and alligators. Different crocodilian groups independently evolved long jaws to clasp their prey. This can make it tricky to trace a crocodilian's ancestors.
c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.97

5
Ammonite (*Acanthoceras rhotomagense*)

When this ammonite lived, world sea temperatures were rising. Many ammonites responded to environmental stresses by evolving robust shells, like this one with its prominent ribs.
c.94–96 million years old
Grey Chalk Subgroup
Woolcombe, west Dorset
G.9722

6
Ammonite (*Acanthoceras* sp.)

The shell of the left ammonite is missing, exposing wavy lines called suture patterns, but that of the right ammonite is intact.
c.94–100.5 million years old
Grey Chalk Subgroup
G.9754 (left) and G.8200 and (right)

7
Sponge (*Siphonia* sp.)

This extinct type of sponge attached itself to the seafloor with a stem.
c.75–99 million years old
White Chalk Subgroup
Dorchester, south Dorset
G.9059

8
Bivalve (*Inoceramus labiatus*)

The shell sizes of this bivalve genus ranged from a few centimetres up to around a person's height.
c.86–94 million years old
White Chalk Subgroup
Winterborne Houghton, mid-Dorset
G.9863

9
Ammonite (*Mariella* (*Mariella*) *lewesiensis*)

Ammonites like this may have lived like snails on seafloors.
c.99–100.5 million years old
Grey Chalk Subgroup
Isle of Purbeck, southeast Dorset
G.9713

10
Bivalve (*Neithea quinquecostata*)

These delicate scallops dug their little burrows with specially adapted, blade-like feet.
c.80 million years old
White Chalk Subgroup
Thorncombe, near Dorchester, south Dorset
G.9950 and G.9951

11
Fish (*Ptychodus latissimus*)

Ray teeth like these, and those of sharks, were fossilised more often than their cartilage skeletons.
c.75–99 million years old
White Chalk Subgroup
Martinstown, near Dorchester, south Dorset
G.337A–G.337B

12
Sea lily (*Marsupites* sp.)

Sea urchins, starfish and sea cucumbers all belong to the same group as this animal.
c.85 million years old
White Chalk Subgroup
Possibly Thorncombe, near Dorchester, south Dorset
G.9391 and G.9404

13
Brachiopods (*Cretirhynchia plicatilis*)

Brachiopods attach themselves to the seabed using a stalk (pedicle).
c.75–94 million years old
White Chalk Subgroup
Thorncombe, near Dorchester, south Dorset
G.9358 and G.9360

14
Sea urchin (*Micraster cortestudinarium*)

This type of sea urchin was around for ten million years.
We can trace evolutionary changes in its fossils.
c.75–94 million years old
White Chalk Subgroup
Dorchester, south Dorset
G.9488

15
Sea urchin (*Discoidea cylindrica*)

Sea urchins move slowly across the seafloor eating algae, protected by their hard shells and, usually, spines.
c.80–95 million years old
White Chalk Subgroup
G.9650

16
Lobster (*Enoploclytia* sp.)

Lobster fossils such as this claw are hardly ever found in chalk rock.
c.96 million years ago
Grey Chalk Subgroup
Unknown location, probably Dorset
G.10063

17
Bivalve (*Neithea gibbosa*)

This scallop lived along sandy coastlines. When its home became submerged beneath chalky waters the species stopped living in Dorset.
c.96–103 million years old
Upper Greensand Formation
Near Shaftsbury, north Dorset
G.8449

18
Greensand with bivalves (*Exogyra obliquata*)

Sand and oyster shells in this rock tell us this was a seabed deposit.
c.105 million years old
Upper Greensand Formation
Up Sydling, mid-Dorset
G.8361

19
Lobster (*Hoploparia longimana*)

The body and claw of this 100-million-year-old lobster are very similar to those of today's lobsters.
c.100 million years old
Upper Greensand Formation
Lyme Regis, southwest Dorset
G.8708

20
Hydrozoa (*Parkeria sphaerica*)

These hydrozoa are not individual fossils – each sphere was once a colony of tiny aquatic animals.
c.100–113 million years old
Upper Greensand Formation
Bingham's Melcombe, northeast Dorset
G.7389-G.7391

21
Bivalve with burrow (*Myopholas* sp.)

Here is an unusual combination – the cast of a burrow together with one shell of the bivalve that made it.
c.113 million years old
Lower Greensand Group
Near Ringstead, south Dorset
G.9578

22
Turtle shell (*Hylaeochelys latiscutata*)

You normally see a turtle's top shell (carapace) from the outside. This shell has been fossilised with its inside showing. We can tell this because there are backbones (vertebrae) attached to it. Some animals protect and support themselves with hard shells, others have bones. Turtles have both.
c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.16

23
Fish (*Microdon radiatus*)

The species name of this fish, *radiatus*, helps describe its circular shape and radiating ribs.
c.145 million years old
Purbeck Group
G.251

24
Fish teeth (probably *Mesodon* sp.)

Confusingly, *Mesdon* is a name that has been given both to fish (as here) and land snails.
c.142 million years old
Purbeck Group
Swanage, southeast Dorset
G.273

25
Ammonite (*Sciponoceras* sp.)

Flat-coiled shell shapes worked fine for most ammonites, but some Cretaceous varieties evolved completely different shell forms. This type grew in a straight line, up to 17 centimetres long.
c.93–94 million years old
Upper Greensand Formation
Near Piddletrenthide, mid-Dorset
G.8078

26
Fish spines (Left: *Hybodus* sp., Right: *Asteracanthus verrucosus*)

These protective spines originally protruded from the leading edges of the back (dorsal) fins of ancient sharks.
Left: c.142–145 million years old
Purbeck Group
Unknown location
G.260
Right: c.142–145 million years old
Purbeck Group
Swanage, southeast Dorset
G.277

In the drawer:

Extinction – the end of an era?

Ammonites and dinosaurs were just some of the well-known sea and land animals and plants that vanished as the Cretaceous Period ended in mass extinctions. Today we only know them from fossils. But the end of competing life opened up new opportunities for survivors, including mammals and flowering plants.

The differences between Dorset's Mesozoic life and its wildlife today show how our planet's ecosystems can change irreversibly under environmental stresses.

1
Pterosaur (Pterodactyloidea, unknown species)

Pterosaurs lived when birds were evolving and diversifying. They shared the skies successfully for millions of years until pterosaurs became extinct at the end of the Cretaceous Period, along with dinosaurs.
c.141–142 million years old
Purbeck Group
Langton Matravers, southeast Dorset
G.100

2
Dinosaur (Theropoda, unknown species)

Here is a meat-eating theropod dinosaur tooth. Its owner shared an ancestor with the first emerging birds, like *Archaeopteryx*. Nearly all theropods died out by the close of the Cretaceous but some birds lived on.
c.106 million years old
Lower Greensand Group
Near Swanage, southeast Dorset
G.5514

Mammal evolution

Stereognathus (bottom), whose name means twin-jaw, was a Cretaceous close relative of mammals. After the end-Cretaceous extinctions many new types of mammals evolved, such as horses (top).

3
***Equus* cf. *caballus* molar**
c.1 million years old
Pleistocene gravels
Near Blandford, northeast Dorset
G.11637

4
***Stereognathus* sp. molar**
c.166–168 million years old
Probably Forest Marble Formation
Unknown location, probably Dorset
G.10828

Blooming plant populations

Today most plants fall into three groups – ferns, naked seed plants including conifers, and flowering plants. For much of the Cretaceous most plants were naked seed types such as the top fossil. Flowering plants such as the bottom fossil gradually became successful after the end Cretaceous extinctions.

5
***Cycadeoidea* sp.**
c.142 million years old
Purbeck Group
Portland, south Dorset
G.6626

6
Dicotyledon leaf, unknown species
c.41–56 million years old
Poole Formation
Corfe Castle, southeast Dorset
G.9259

In the drawer:

What makes the Chalk special?

The soft white rock around these fossils is chalk from Dorset's Chalk beds. It is special because almost all this rock type formed during one 30-million-year period in our planet's history, in open seawater that spilled across wide continental areas.

Dorset's Late Cretaceous sea was warm, clear and rich in calcium. Single-celled plants flourished in the water and absorbed the calcium. When they died their minuscule calcium carbonate plates collected on the seafloor, creating the ooze that became the Chalk.

Chalk ammonites

Ammonites living when the Chalk sediments first accumulated developed many shapes, unlike the typical flat coil forms. Some became decorated with bumps and spines, others coiled into snail-like spires. Some even grew straight. They may have tried out new lifestyles too.

1
Turrilites acutus
c.94–96 million years old
Grey Chalk Subgroup
Woolcombe, northwest Dorset
G.9703

2
Stomohamites simplex
c.94–97 million years old
Grey Chalk Subgroup
Unknown location, probably Dorset
G.9698

3
***Idiohamites* sp.**
c.96 million years old
Grey Chalk Subgroup
Stoke Wake, northeast Dorset
G.9697

4
Scaphites* (*Scaphites*) *equalis
c.94–96 million years old
Grey Chalk Subgroup
Swanage, southeast Dorset
G.9709

5
Sponge (*Doryderma* sp.)

This branching sponge animal was buried by chalk. Soon after the chalk accumulated, silica solidified out of groundwater around the sponge to form a lump of flint (nodule).
c.80 million years old
White Chalk Subgroup
Winterborne Stickland, northeast Dorset
G.10825

Spiny invertebrates from the Chalk

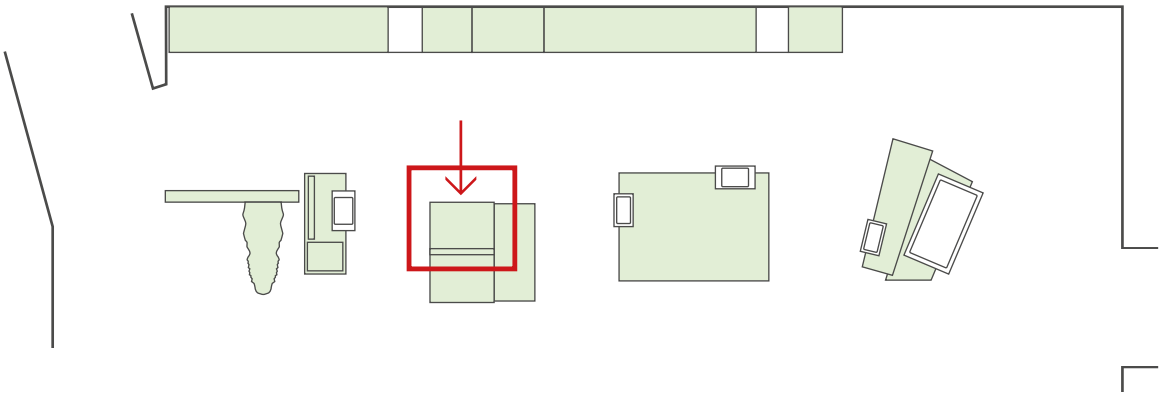
These animals lived on the chalky seafloors. The scientific name for this bivalve (6), *Spondylus spinosus*, describes its defensive spines. The club-shaped spine next to the sea urchin (7) is one of several that originally protruded from bumps on its shell (test), again for protection.

6
Spondylus spinosus
c.85 million years old
White Chalk Subgroup
Bryanston, northeast Dorset
G.10055

7
Hemicidaris intermedia
c.72–100 million years old
Chalk Group
Unknown locality, probably Dorset
G.14873

8
Coral (*Parasmilia centralis*)

Corals rarely colonised chalky seafloors because the ooze was usually too soft to fix to, but there were times when the ground hardened. These solitary corals attached themselves to the ground and grew as self-contained individuals.
c.83 million years old
White Chalk Subgroup
Unknown locality, probably Dorset
G.8887, G.8889-G.8890 and G.8892

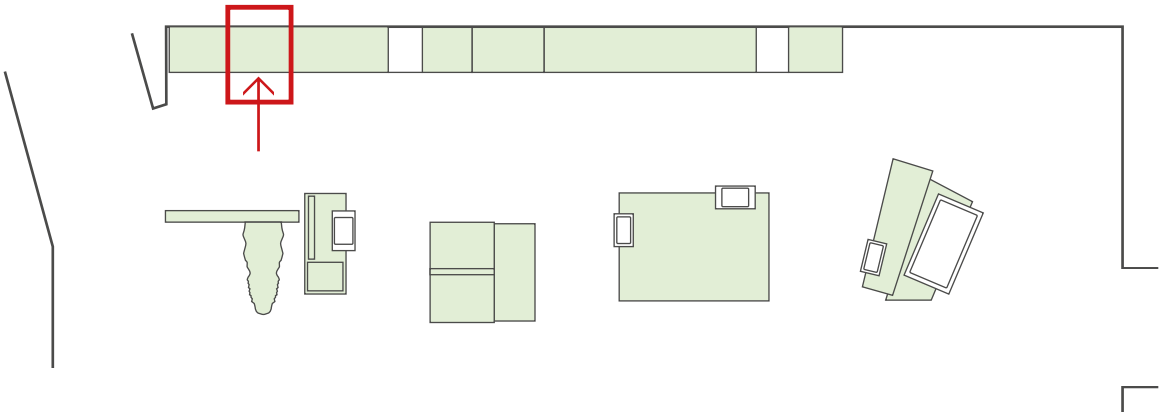


On the plinth:

Swanage snapper

Crocodile (*Goniopholis kiplingi*), holotype

Freshwater swampy lagoons covered expanses of Early Cretaceous Purbeck, southeast Dorset. Suspended just beneath the calm surface of one lagoon, this substantial crocodile (below) would have waited motionless to ambush unsuspecting animals. Baby dinosaurs drinking along the shoreline, fish and turtles swimming within its range were all potential victims. Once engaged, this predator was swift and agile. It thrashed and rolled, gripping its prey until drowning or injury brought about death. That is, if it behaved anything like today's crocodiles.
c.140 million years old
Purbeck Group
Peveril Point, southeast Dorset
G.12154



In the showcase:

Early Palaeogene Dorset
66–44 million years ago

Modern life dawns

Earth's great landmasses continued to separate, and arranged themselves into the continents we recognise today. Around 50 to 25 million years ago, Africa drifted northwards towards Europe, pushing up the Alps. Distant Dorset was affected less dramatically. Rocks rose around the region. The Chalk folded and domed into highs across south Dorset's ridgeway and east Dorset's Cranborne Chase. In some places water eroded the Chalk creating vales such as Blackmore, north Dorset.

Life multiplied after the end-Cretaceous extinctions, and flowering plants flourished under Dorset's warm-temperate climate. Sediments built up in rivers, lagoons and the sea. These deposits support east Dorset's heathlands today.

1

Stair Hole, Dorset, Looking East

Dorset's landscapes have attracted artists as well as scientists for centuries. Here the artist Frederick Whitehead captures a dramatic rock-fold structure, the Lulworth Crumple. It is one example of the ways rocks folded across Dorset 50 to 25 million years ago, at the margin of the massive movements that raised the Alps.
Frederick William Newton Whitehead (1853–1938)
Oil on card on board
1890s
ART.2421

2

Palm frond (*Trachycarpus raphanifolia*)

Palms are evergreen flowering plants which grow in subtropical to tropical regions with a reliable water supply – just like Dorset early in the Palaeogene. These fan-shaped palm leaves are from a plant-rich bed of fine clay that was deposited where a river met the sea, slowed and dropped its sediment.
c.47–56 million years old
Poole Formation
Possibly near Corfe, southeast Dorset
G.2283 and G.9256

3
Ironstone pipe

Pipes like this formed naturally within sands around Studland, but what made them? One suggestion is that rising pressure triggered gases to escape upwards through fermenting organic-rich sediments. Then iron in the sediments combined with sulphur compounds in groundwater to form pyrite (iron sulphide) tubes around the spaces the gases had created.
c.45–47 million years old
Poole Formation
Studland Bay, southeast Dorset
G.606

4
Molluscs (*Turritella* sp. and *Cytherea* sp.)

This rock is packed with snail and bivalve shellfish (molluscs). The high-spired snails were aligned by water currents which flowed over them on the seabed before they were buried by sand. Their original shells dissolved away. What remains is the sediment that filled the spaces inside their shells.
c.48–56 million years old
London Clay Formation
Wimborne Minster, east Dorset
G.3630

5
Plane tree wood (*Plataninium* sp.)

This wood has been petrified – turned to stone – without being flattened, so it still has some original structures. These suggest it is from an extinct plane tree. Plane trees have maple-like leaves and ball-shaped fruit that can also be fossilised. When they are found separated it can be difficult to establish their species.
c.44 million years old
Thames Group, Bracklesham Group or Barton Group
Pallington, south Dorset
G.11715

6
Wood (unknown species)

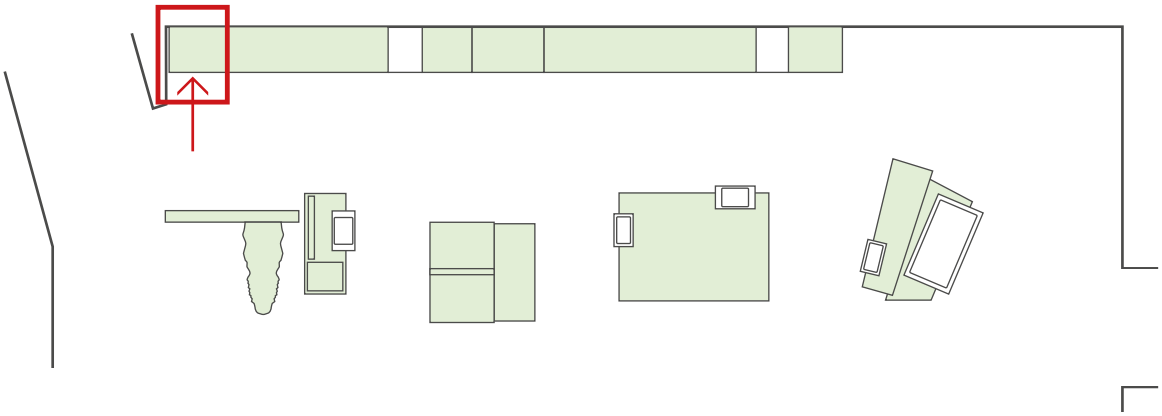
Here is some wood from a plant that grew as part of a forest near rivers. It fossilised before becoming completely squashed, so you can see its growth rings. It retains some of its original carbon too. The rocks this wood came from also contain carbon-rich compressed peat seams.
c.34–56 million years old
Probably Bracklesham Group
Hamworthy, southeast Dorset
G.8691

7
Flowering plant leaves

You can see tiny details of these leaves' original textures because they were preserved in clay. Can you spot where Palaeogene insects nibbled the edges of a leaf? Today's flowering plants and insects often depend on each other to live. This is fossilised evidence of how they needed each other in the Palaeogene too.
c.47–50 million years old
Poole Formation
Mostly Canford Cliffs (G.11691 from unknown location), southeast Dorset
G.11691, G.13648, G.13649, G.13666, G.13678 and G.14337

8
Beetle (unknown species)

Beetles are insects whose front pairs of wings form hard cases called elytra. Because of this, the beetle group's scientific name is Coleoptera, meaning sheath wing.
Many beetles have patterned or brightly coloured elytra for camouflage or display. This elytron is from the same clay beds as the leaves displayed here.
c.47–50 million years old
Poole Formation
Studland Bay, southeast Dorset
G.10500



In the showcase:

Quaternary Dorset
Up to 1.5 million years ago

Climate in crisis

The world's climate became unstable and deteriorated in the Quaternary Period.

Climates cooled, although there were occasional warmer spells. As temperatures dropped, sea levels fell and land connected mainland Europe to Britain. Animals migrated across – at times woolly rhino and mammoths lived in Dorset. During warmer periods people settled in Britain. Dorset's sea rose, leaving beaches on Portland high above today's sea level.

Extreme climate changes shaped Dorset's landscape. From 13,000 years ago, after the most recent cold pulse, temperatures and sea levels rose. Storms and advancing waves swept up Chesil's massive shingle bank and Dorset's beaches.

1
Deer antlers (*Cervus elaphus*)

These antlers are from ancestors of the red deer that live in Scotland and parts of England today. Unlike other large animals, such as woolly rhinoceroses and mammoths, populations of red deer survived the ice ages and the final thaw that led to today's climate.
c.10 thousand years old
Holocene river gravel
Top: Bulbarrow, northeast Dorset (G.417)
Bottom: Radipole, south Dorset (G.434)
G.417 and G.434

2
Mammoth scapula (probably *Mammuthus meridionalis*)

This shoulder-blade bone (scapula) belonged to a young mammoth. If it had reached adulthood, its shoulder height would have been about four metres. Dorset's climate was mild when this mammoth lived.
c.1.5–2.5 million years old
Pleistocene gravels
Near Stalbridge, north Dorset
G.409

3
Mammoth molar (probably *Mammuthus meridionalis*)

Mammoths were huge relatives of today's elephants. They roamed western Europe at the same time as woolly rhinoceroses. Mammoth and elephant teeth are very distinctive. They have a series of folds and ridges at the root, and a massive crushing surface at the crown, used for grinding grasses and sedges.
c.1 million years old
Pleistocene
Blandford, northeast Dorset
G.11670

4
Models of adult and young mammoths

Just as sea levels can rise when our planet warms, they can fall when it cools and more water freezes in glaciers. During ice ages the English Channel's sea levels sometimes dropped so much that land bridges formed between Britain and northwest Europe. Mammoths migrated across these into Dorset.

5
Rhinoceros femur and molar (*Coelodonta* sp.)

Woolly rhinoceroses lived around here during the Earth's last cool phase around 21 thousand years ago. They became extinct when the climate warmed and people hunted them excessively. Their dental cavities are why they are called *Coelodonta* – hollow tooth.
c.10–21 thousand years old
Pleistocene drift
Edmund's Mere, near Zeals, Dorset/Wiltshire border
G.443.3 (femur) and G.11639.4, (molar)

6
Model of a woolly rhinoceros

Rhinoceros means nose horn. Woolly rhinoceroses had two horns made of the fibrous protein keratin, which our hair and nails are also made of. Their front horns were around 61 centimetres long. They could have used their horns to defend themselves against other large animals, or when fighting for a mate.

7
Horse molars (*Equus* sp.)

The horse family began evolving 55 million years ago. Early members were usually up to 50 centimetres high and had quite short legs ending in multiple hooves. Their teeth were suited to browsing leaves and fruits. When grasses flourished, horses' teeth became high-crowned and crested like these, allowing them to grind coarse blades of grass.
c.12 thousand years old – 2.5 million years old
Pleistocene gravels
Near Blandford, northeast Dorset
G.15105

8
Pebble conglomerate

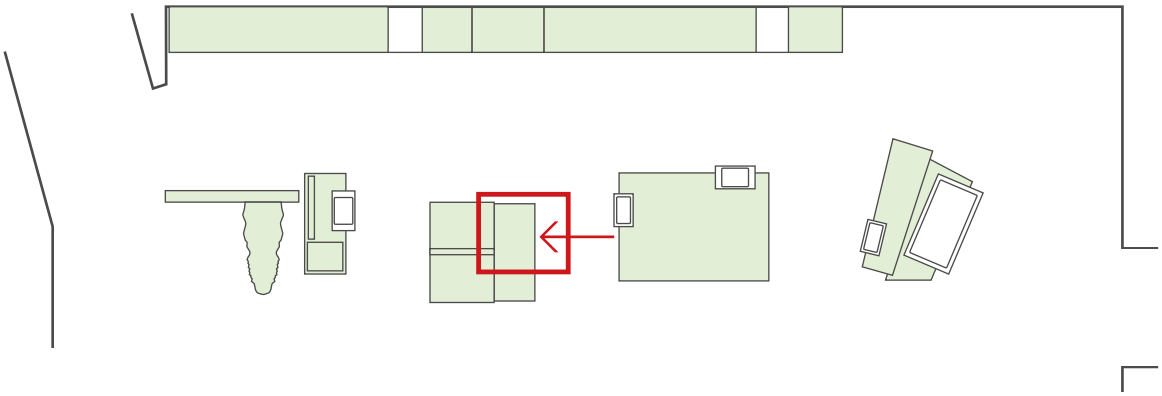
When the Chalk eroded, flint was released and washed downstream. Pebbles rolled about and were worn into rounded shapes. They came to rest upon a Portland beach that was higher than today's coastline. The world's glaciers held less water than today's at this time, so sea levels were higher.
c.125–200 thousand years old
Pleistocene deposit
Near Portland Bill, south Dorset
G.11656

9
Nuts (probably *Corylus avellana*)

Where the River Char meets the sea at Charmouth, you can sometimes see the remains of an old forest on low spring tides. These hazelnuts dropped off bushes growing alongside birch and ash trees upstream. The nuts drifted downstream with branches and seeds, and sank where the river slowed as it neared the sea.
c.2–11 thousand years old
Holocene clay drift
Charmouth, west Dorset
G.14819

10
Snails (probably *Littorina* sp.) and bivalves (unknown species)

In this specimen you can see bivalves and snails, including a large periwinkle, which lived along an ancient shoreline. They are mixed up with beach sands and pebbles. The fossilised beach this piece comes from is three metres higher than today's sea level. It formed between ice ages when the climate was warm.
c.125 thousand years old
Pleistocene deposit
East Portland Bill, south Dorset
G.11638



On the plinth:

A world in miniature

Today some living things are tiny, and this was true in the past too. Look closely through the magnifiers and see how small Cretaceous insects and crustaceans have been fossilised.

Dragonfly wings (*Aeschnidium* sp.)

This dragonfly wing landed on a Cretaceous muddy shoreline, and the clay preserved its fine details amazingly well. We identify dragonfly varieties by looking at differences in their wing vein patterns. It is difficult to determine how big they were originally though, because wings can dry and shrink after death.
c.140 million years old
Purbeck Group
Durlston Bay, southeast Dorset
G.6588

Bug (*Nepidium* sp.)

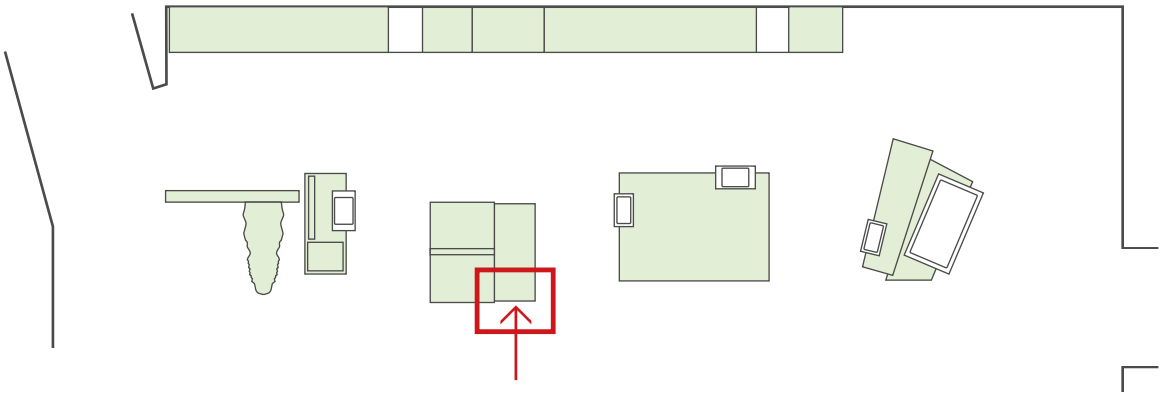
This is a young bug (nymph). Bug insects include froghoppers, cicadas, aphids – like greenfly – and shield bugs. You can find some types of these bugs in Britain. This fossil shows how little bugs have changed over millions of years – because their general design has worked in many conditions.
c.140 million years old
Purbeck Group
Near Bincombe, south Dorset
G.14682

Grasshopper wing (Acridomorpha, unknown species)

Fossils are incredibly important because they can help show us the complex relationships between things living millions of years ago. The grasshopper who used this wing hopped and buzzed around a Purbeck landscape inhabited by dinosaurs.
c.140 million years old
Purbeck Group
Near Bincombe, south Dorset
G.14712

Ostracod (*Cypridea fasciculata*)

Ostracods are tiny crustaceans sometimes called seed shrimps. They live in between two shells that they produce, which make them look a little like seeds. They can be found in soils in humid regions but also live on seafloors, as plankton in the sea, and in freshwater habitats.
c.140 million years old
Purbeck Group
Durlston Bay, southeast Dorset
G.6401



Please touch

These models give an idea of the types of microscopic organisms that lived in Dorset's Mesozoic seas, and whose fossils can be found in rocks. Feel their interesting shapes and curves.

Ostracod (Ostracoda)

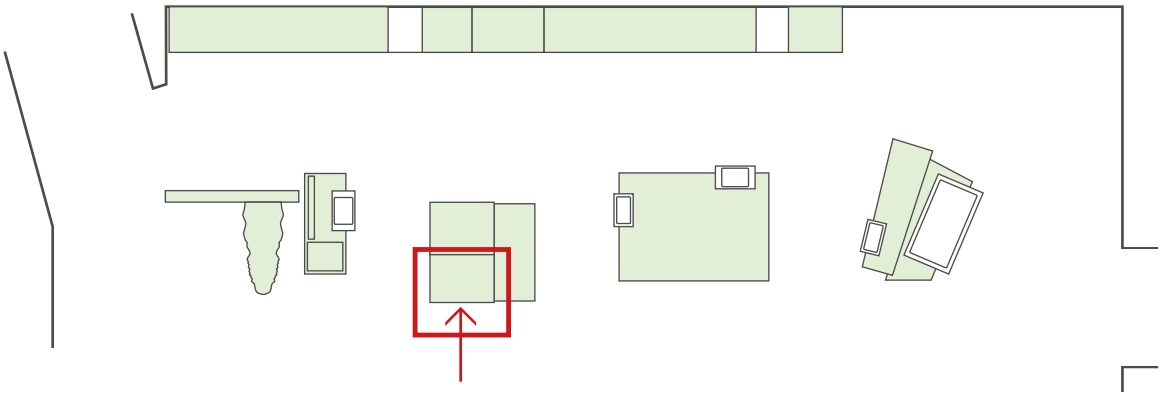
The soft bodies of ostracods are protected by two shells. These crustaceans are relatives of crabs, lobsters and barnacles. Their actual size is about five millimetres.

Foraminifera

Does this feel a bit like miniature ammonites or snails? They are not closely related. Foraminifera are single-celled organisms called protists. Their actual size is about 0.5 millimetres.

Coccolith (Prymnesiophyceae)

These single-celled algae (phytoplankton) take in carbon dioxide from seawater, like land plants do from the air. Their actual size is about 0.02 millimetres.



Invisible to the naked eye

Some Dorset rocks, for example Chalk, contain unimaginable numbers of microscopic and even sub-microscopic fossils. The single-celled organisms in this image are called foraminifera. They still thrive on seafloors, or are suspended in seawater as plankton. They produce shells (tests) in a tremendous variety of forms.

Get up close

Try out the microscope below. See microscopic forms and structures of foraminifera, other tiny shells and sediment on the screen. Gently move the turntable and choose a chamber to view. Then press the buttons to zoom and focus.

Although foraminifera were fossilised in Dorset rocks, the samples in chambers 1–4 under the microscope are from other regions where they were better preserved. Today foraminifera shells can wash onto coasts and mix with beach sediment (chambers 5–8).

1
Fossilised samples,
100.5–113 million years old,
Gault Formation, Folkestone,
Kent, south England

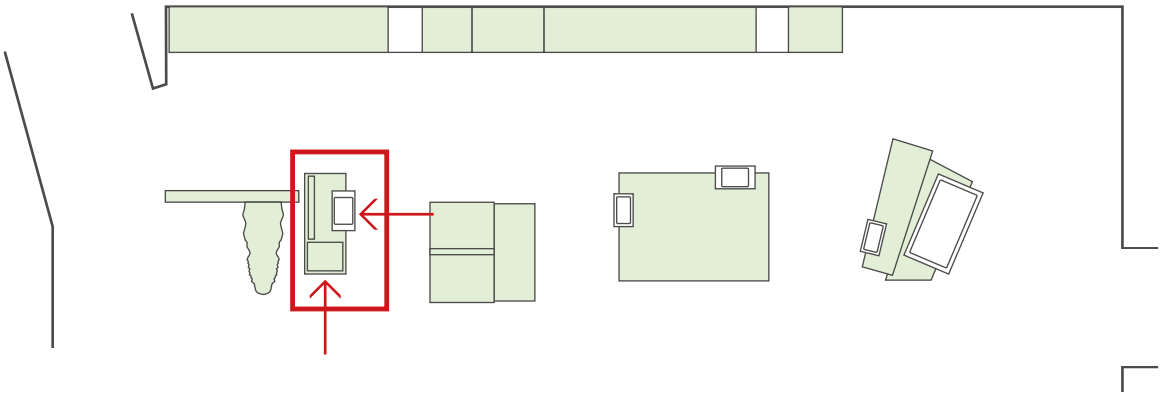
2
Fossilised samples,
c.65–100 million years old,
Chalk Group, Saratoga, Arkansas, southeast United States

3–4
Fossilised samples,
2.5–5.5 million years old,
Neogene clay, Pieve di Cusignano, Parma, northwest Italy

5
Non-fossilised samples,
c.2020, Langton Herring, southeast Dorset

6
Non-fossilised samples,
c.2020, Swanage, southeast Dorset

7–8
Non-fossilised samples,
c.2020, North Indian Ocean



On the plinth:

Enjoy hunting for fossils safely

You don’t need to visit a museum to find evidence of real dinosaurs. Explore a Dorset beach such as Charmouth or Lyme Regis and you may be the first to discover a unique piece of ancient life.

Here are ten tips to help protect you and the environment.

1
Plan ahead – check conditions are safe at your destination, and access and fossil hunting are permitted.

2
Check the weather and tides – collect on a falling tide.

3
Take clothes suitable for the conditions.

4
Tell someone where you are going and for how long.

5
Keep away from cliffs, landslides, large waves and deep water.

6
Avoid disturbing wildlife.

7
If taking tools, check they're permitted, only use them when necessary and wear eye protection.

8
Be aware of other people – leave areas safe and tidy.

9
Fossils are for everyone – collect a few and treasure them.

10
If you've found a specimen that might be scientifically Important, take it to a museum or heritage centre.

If there's an emergency at the coast, dial 999 or 112 and ask for the Coastguard.

In the showcase:

Ali's cabinet of curiosity

Ali Ferris, Deputy Senior Warden at Charmouth Heritage Coast Centre, shares with us the treasures that inspired her curiosity about nature.

1+2
Amethyst and calcite minerals

I was fascinated by amethyst when I was young and I collected this purple crystal. You can find shiny white calcite crystals like this one on the Jurassic Coast.

3+4
Fossil and modern sea urchins

I love fossil hunting and beachcombing. These sea urchins are separated by 100 million years and I found both along the Jurassic Coast.

5+6
Ichthyosaur and dolphin vertebrae

These backbones come from creatures that look alike but are not related and are separated by millions of years. We find fossil and modern vertebrae along the Jurassic Coast.

7
Fossil poo (coprolite)

I have quite a collection of fossil poo – some even contain bones and teeth. Mary Anning had a great coprolite collection. Thanks to her we know more about coprolites.

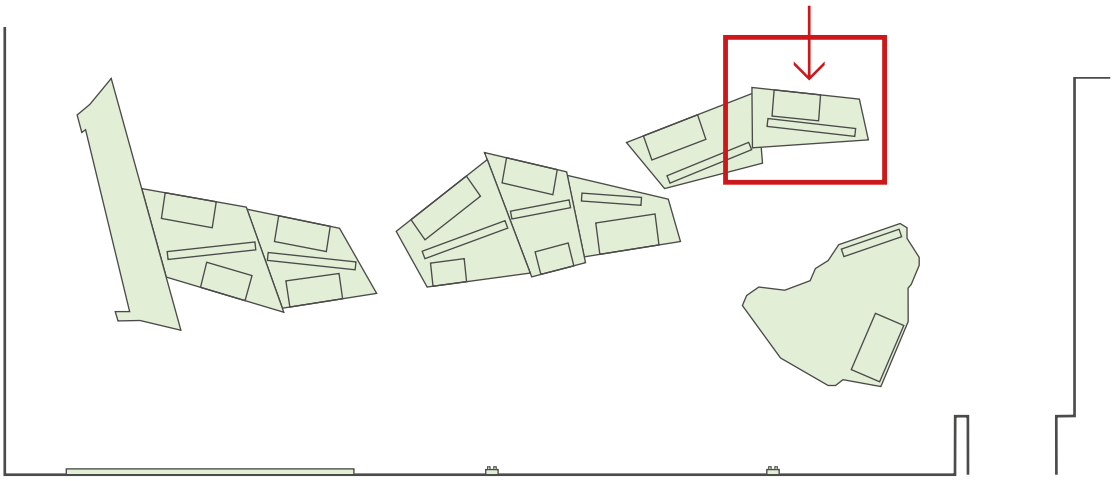
8
Sea lily (crinoid)

This is the first fossil I ever discovered, when I was a girl in Wiltshire. Sea lilies are also found on the Jurassic Coast. Can you see all the little stars?

9
Ammonite

In 1996 my school class went fossil hunting at Charmouth with the Heritage Coast Centre Warden. I found this ammonite. Twenty years later I began working there too!

On loan from Ali Ferris
LI.2020.2



On the plinth:

A world of wonder

Discovering deep time

Dorset people helped to change thinking about the origins of life from the early 19th century. Most important was fossil collector Mary Anning, whose discoveries inspired others to collect, identify and interpret specimens.

Around 200 years ago most people didn't realise that the world had a prehistoric past, or that dinosaurs had existed. Fossils were objects of curiosity and some people explained them through stories of sea monsters and demons.

From the late 18th century geologists started to realise that fossils came from animals that lived long before people, and that the Earth was far older than anyone had thought. This led them to question traditional Christian explanations of how the world had begun, and inspired an enthusiasm for investigating the natural environment.

Please touch

Fossil folklore

People have found fossils in rocks for thousands of years and tried to make sense of what these strange things might be.

Far left

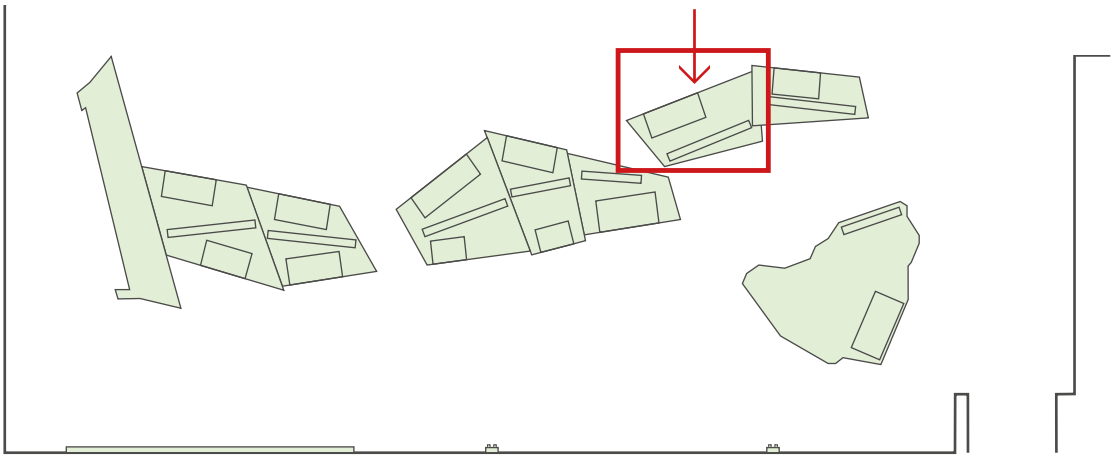
Thunderbolt according to Dorset folklore (*Megateuthis elliptica*)

People believed belemnites were thunderbolts turned into rock. In fact, the long cone shapes are the internal shells of squid-like animals.
c.166–170 million years old
Inferior Oolite Formation
Near Sherborne, north Dorset
Donated by John Whicher and Robert Chandler, prepared by John Whicher

Left

Devil's toenail according to Dorset folklore (*Gryphaea arcuata*)

Oysters with their incurved shapes and thickly ridged growth-band layers were thought to look like toenails – from devils in dire need of pedicures.
c.190–200 million years old
Lias Group
Fretherne, west Gloucestershire
Donated by Robert Chandler



On the plinth:

Mary Anning

The world's greatest fossilist

Lyme Regis became famous for fossils in the early 19th century. This was mainly thanks to Mary Anning (1799–1847), a local woman whose discoveries helped create palaeontology, the science of fossil animals and plants.

Anning was born to a working-class family. Her father collected and sold fossils to earn extra money, a job 11-year-old Mary and her brother Joseph took over after he died. Anning found her most spectacular fossils after storms, when rock falls revealed treasures hidden within the cliffs. That was also when her work was most dangerous because more rocks could fall at any time.

Anning didn't just find fossils, she also prepared, identified and interpreted them. Geologists visited her and described her specimens in scientific papers that slowly changed thinking on their origin. As a woman, Anning could not join the Geological Society and received limited credit for her work when she was alive.

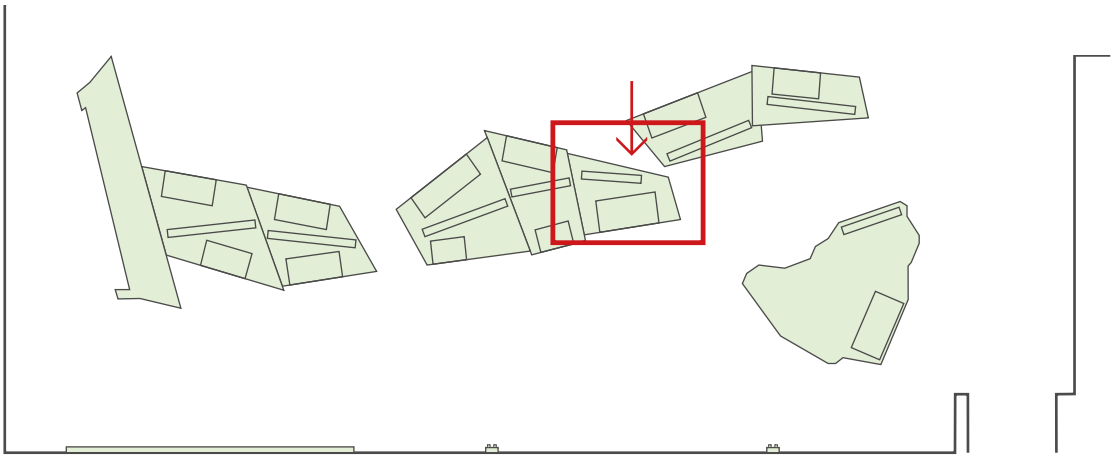
On the column:

Suspended above

Mary Anning's ichthyosaur

Mary's brother Joseph discovered the skull of an ichthyosaur (a marine reptile) in 1811, when Mary was 12. This is a replica of that skull, the first ichthyosaur fossil to reach scientific attention. The following year Mary spent months carefully extracting the rest of the fossil, astounding local people. The original skull is in London's Natural History Museum.

Fibreglass cast
Original specimen:
Temnodontosaurus platyodon sp. nov.
194–201 million years old
Lias Group
Lyme Regis, west Dorset



On the plinth:

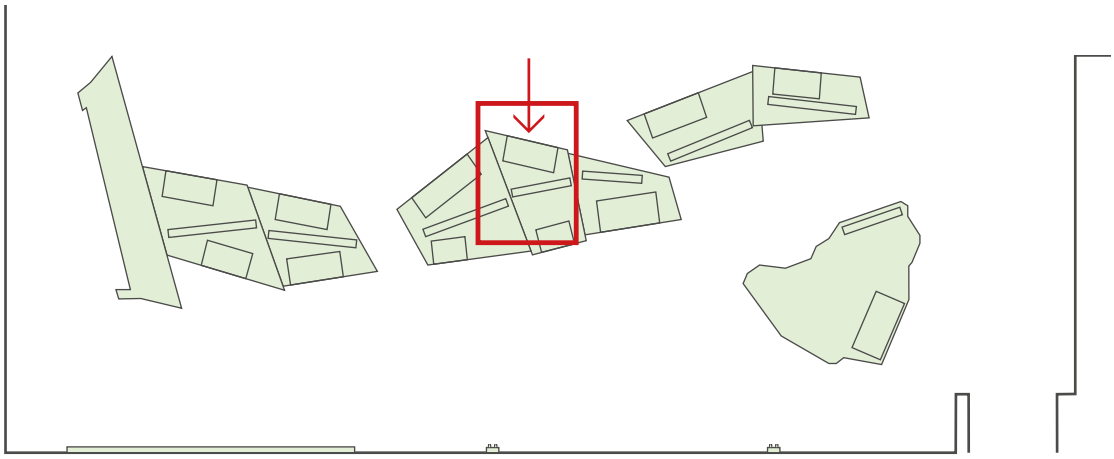
Alfred Russel Wallace and Charles Darwin

On the origin of evolutionary theory

Geologists learnt about prehistoric life by studying fossils. What they discovered led other scientists to develop the theory of evolution through natural selection.

This theory suggested that living organisms change over generations, and that changes that make them better adapted to their environment increase their chances of surviving and producing offspring.

Most people know Charles Darwin put forward the theory of evolution. Fewer have heard of Alfred Russel Wallace, who developed similar thoughts on evolution at the same time. Their ideas were first presented together at a meeting of the Linnean Society in 1858.



On the plinth:

Alfred Russel Wallace

When two worlds collide

Alfred Russel Wallace (1823–1913) spent a lot of time outdoors during his first career as a surveyor. He grew fascinated by nature, and studying plants and animals became his life's work. He developed ideas about evolution at the same time as Charles Darwin (1809–1882).

Wallace spent about 20 years on expeditions to test his ideas about evolution. He finished his theories while he was exploring the Malaysian islands between 1854 and 1862.

All those expeditions were expensive. Wallace funded them by catching and killing exotic specimens that he sent home to sell to collectors. Later in life he became troubled by the effects of this kind of destructive behaviour, and worried that Europeans would ruin the tropical forests he had explored.

Wallace moved to Dorset in his sixties and was made an honorary member of the Dorset Natural History and Antiquarian Field Club in 1909. He is buried in Broadstone.

In the showcase:

1

Alfred Russel Wallace's birds of the Malay

On Wallace's trips to the Malaysian islands he collected over 8,000 bird specimens. Studying them helped him develop his theories on evolution.

Left to right:
Rainbow bee-eater (*Merops ornatus*)
V.1063

Black-headed pitta (*Erythropitta ussheri*)
V.1055

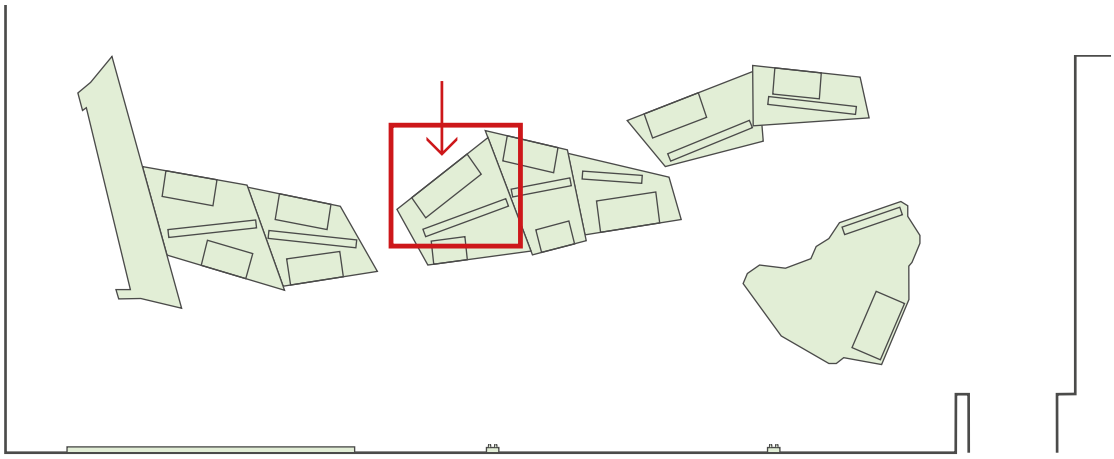
Many-coloured barbet (*Megalaima rafflesii*)
V.1075

2

On the Origin of Species by Means of Natural Selection

This rare first edition belonged to James Buckman, a geologist and natural historian who had corresponded with Darwin and lent him fossil specimens. Buckman later farmed in Dorset, selectively breeding new plant varieties. He bound a letter from Darwin into the book's spine.

Charles Darwin (1809–1882)
John Murray, London
1859
L.2010.232



On the plinth:

The Dorset naturalists

Working in the field

Scientific discoveries in the 19th century inspired enthusiasm for collecting, classifying and investigating the natural world.

The richness and diversity of Dorset's natural world encouraged amateur and professional naturalists to collect and study local plants, insects, birds and other wildlife. They pressed, dried and displayed botanical samples, or exchanged them with other enthusiasts. Insect collectors bought equipment and preservation materials to catch and 'set' their specimens. Those working in the field used notebooks to record sightings and information about specimens they collected.

Naturalists shared their findings and ideas at the natural history field clubs and societies that formed across Britain during the 19th century. One of these was the Dorset Natural History and Antiquarian Field Club, which started in 1875. The club merged with Dorset Museum in 1928 and was renamed the Dorset Natural History and Archaeological Society.

In the showcase:

1
Club minutes

Visits to natural and archaeological sites are described in these minutes of the Dorset Natural History and Antiquarian Field Club. The club initially met in Sherborne and included geologists, naturalists and antiquarians.
1875–1884
RD.2880

2
Sidney Brown's microscope slides

Entomologists (insect experts) fix whole small insects onto slides to study under microscopes and keep as records. They dissect larger insects and 'set' interesting parts, such as the mouth parts that identify some species. This slide box was put together by local entomologist Sidney Brown (1903–2003).
Mid to late 20th century
IV.3285.4 (M91-M159)

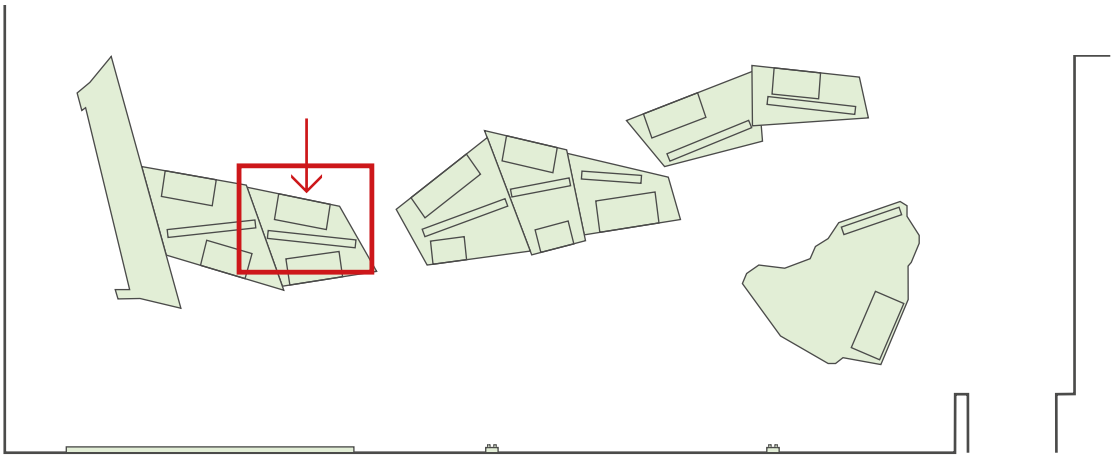
3

Arthur Graveson's nature diary

Science teacher Arthur William Graveson (1893–1979) used his nature diary to record the seasonal appearance of wild plants and flowers. When he ran Beaminster Grammar School's Field Club, he encouraged his pupils to explore their surroundings and find specimens near the school.

1915

NHMS.XVI/4



On the plinth:

John Clavell Mansel-Pleydell

Capturing Dorset in full bloom

Imagine how long it takes to collect, dry and press 10,000 plants. John Clavell Mansel-Pleydell (1817–1902) did just that to make his Dorset herbarium.

He left this unique record of Dorset's 19th-century plant life to the Museum. He also wrote the first full book on Dorset's flora, published in 1874.

Mansel-Pleydell is famous in Dorset for his contribution to botany, but his interests went far beyond that. He published books on Dorset birds and molluscs and discovered important fossil specimens including the almost complete pliosaur paddle you can see in this gallery, and elephant bones and teeth dating from the ice age. He was also a founder member of the Dorset Natural History and Antiquarian Field Club, and its President from 1875 until he died.

John Clavell Mansel-Pleydell **(1817–1902)**
Anthony du Brue
Oil on canvas
c.1902
ART.2349

In the showcase:

1
Pliosaur teeth (*Pliosaurus macromerus*)

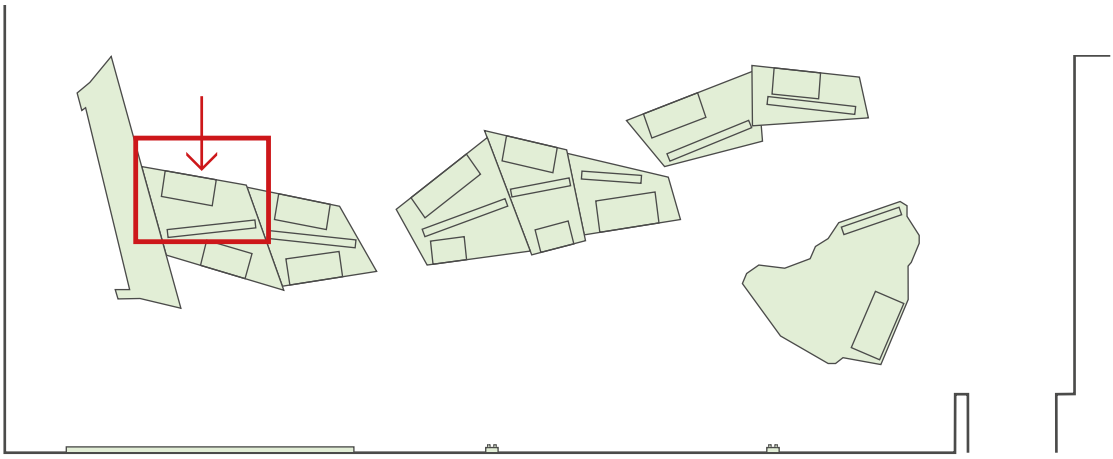
Found by Mansel-Pleydell.
155 million years old
Kimmeridge Clay Formation
G.132.3

2
Plaque for Mansel-Pleydell's herbarium

This plaque was probably displayed in Dorset Museum with specimens from the herbarium. Until the 1970s, all exhibits were shown in what we now call the Victorian Hall.
2020.27

3
Ammonite (*Liparoceras bechei*)

Found by Mansel-Pleydell.
195–201 million years old
Lower Lias Group
G.1082



On the plinth:

Helen and Nelson Richardson

A shared passion

Helen and Nelson Richardson lived in Chickerell near Weymouth. Together they collected and documented moths and butterflies (Lepidoptera) on Portland and Purbeck, and discovered a number of new species.

Nelson (1855–1925) shared his ideas with other entomologists at the Dorset Natural History and Antiquarian Field Club. His natural history interests were wide. He discovered an almost complete skeleton of a plesiosaur near his home in Chickerell.

Helen (c.1855–1936) was an enthusiastic field worker, collecting moths at night on Portland. She also illustrated specimens in intricate watercolour paintings – some were reproduced as colour plates in her husband's research papers. She did not join the Dorset Natural History and Antiquarian Field Club until 1924, just before her husband died.

In the showcase:

1

Original watercolour by Helen Richardson

Here is one of the many watercolours Helen Richardson painted in the late 19th century.

NHMS XVIII

2

Reproduction of watercolour by Helen Richardson

Reproduced in Nelson Richardson, 'On some of the chief peculiarities in the Lepidopterous Fauna of Portland' in *Proceedings of the Natural History and Archaeological Society*, Vol 11, 1890.

On the column:

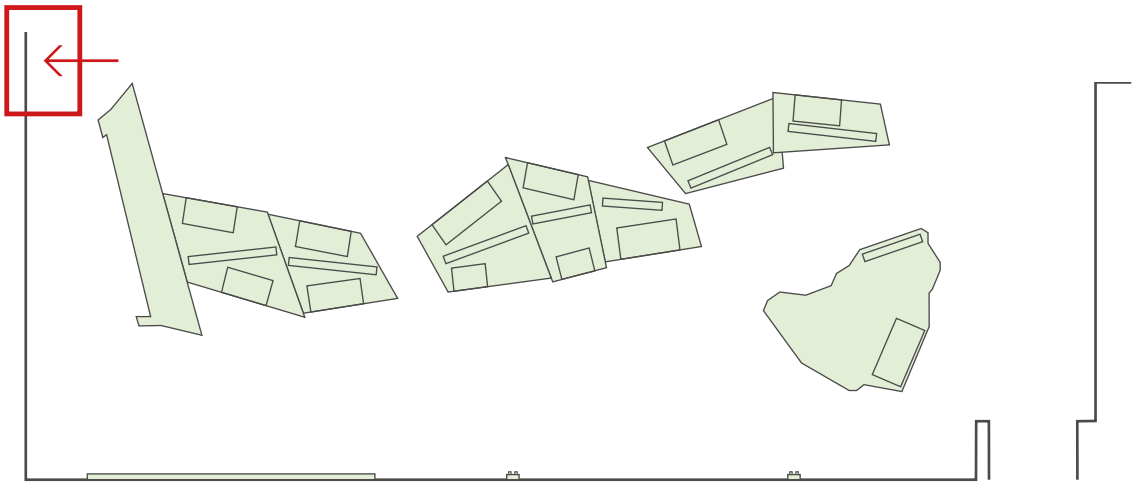
Suspended above

Common sturgeon (*Acipenser sturio*)

Nearly three metres long and weighing 92 kilograms, this common sturgeon was caught in the River Frome by Major Charles Robert Eustace Radclyffe in 1911.

Radclyffe, a fishing and shooting enthusiast, claimed the sturgeon was the largest fish ever hooked with a rod and recalled taking an hour and three quarters to catch it. He presented it to King George V who suggested he donate it to Dorset Museum.

1947.18



On the wall:

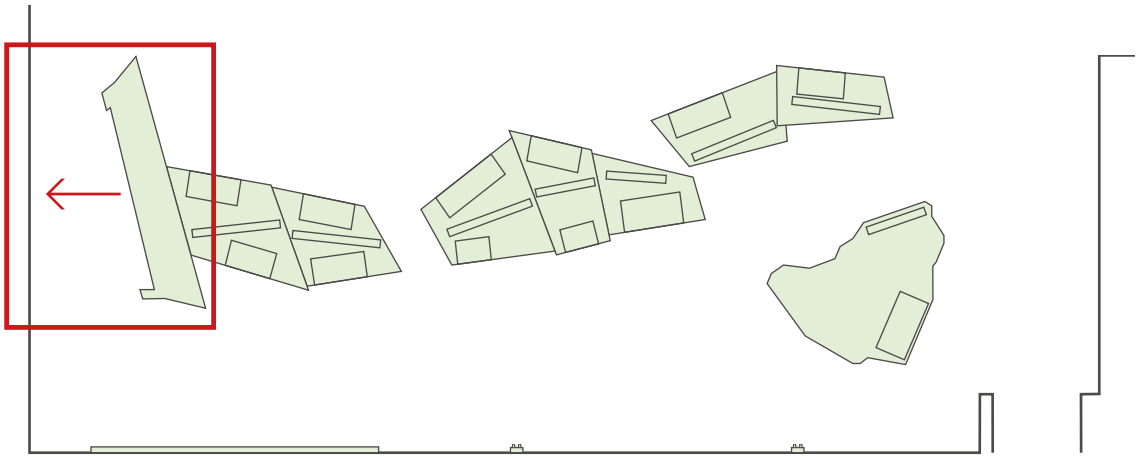
A museum for natural history

From collecting to conservation

Dorset Museum was founded in 1845 and collected natural history specimens from the beginning.

Methods of preserving animal specimens through taxidermy improved over the 18th and 19th centuries. From the 1820s taxidermists started to display groups of birds in dioramas, adding backdrops showing their natural habitat. Public museums acquired many of these specimens for their growing collections.

Collecting was often destructive. Animals were shot and birds' eggs were taken from nests, which is now illegal. But historic specimens give us information about species at points in the past. They also help demonstrate some of the conservation issues facing Dorset today.



On the wall:

Dorset's Natural World

Looking after Dorset's natural world

Early conservationists began taking steps to protect the natural world in the late 19th and early 20th centuries. Their thinking helped shape conservation today.

Naturalists began to question and challenge destructive ways of collecting. They also recognised how industrialisation, urbanisation and roads were having a growing impact on the landscape and its habitats.

Field glasses, binoculars and photographs gave people new ways to survey and study wildlife without doing as much harm to the natural world. In the 1930s some naturalists started using large-scale surveys to collect ecological data, often helped by amateurs and volunteers.

New organisations started up to help conserve plant and animal life. Some bought or were given pieces of land and protected them by turning them into nature reserves.

Above

Notice for the protection of wild birds

The first parliamentary act designed to protect wild birds – the Sea Birds Preservation Act – was passed in 1869. The Wild Bird Protection Act followed in 1880, but most people ignored it and individual councils were free to decide which birds were protected. The more comprehensive and effective Protection of Birds Act was not passed until 1954.
Dorset County Council
1925
RD.2879

Above

Poster for the Dorset Trust for Nature Conservation

Elisabeth Frink created the artwork for this poster marking 25 years of the Dorset Trust for Nature Conservation. The Trust was founded in 1961 as the Dorset Naturalists' Trust, and became Dorset Wildlife Trust in the 1990s. Today it has around 25,000 members and manages over 40 reserves.
1986
ART.481

Protecting Dorset's plant life

Moves to protect Britain's wild plants and flowers grew in the 1930s as transport links improved and more people came to the countryside.

Above left

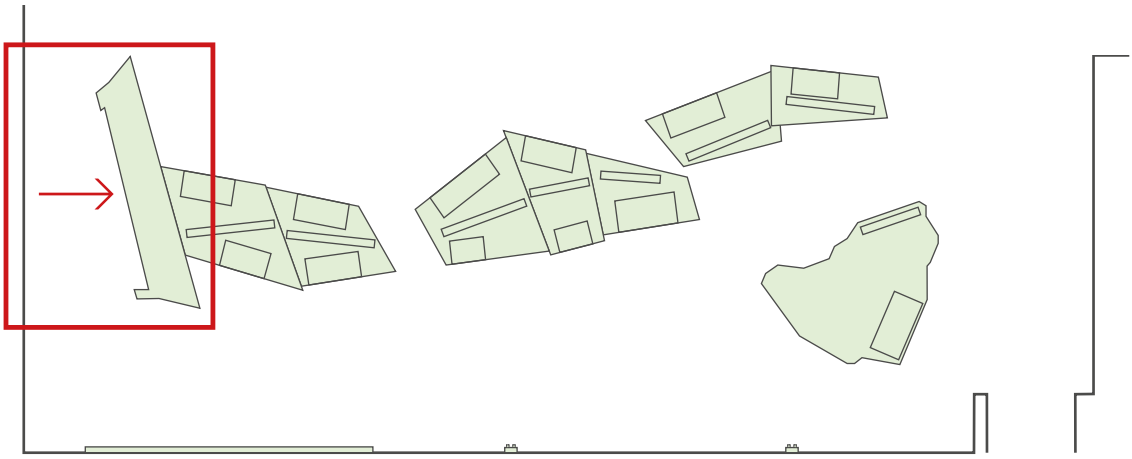
Notice for the protection of ferns and wild plants

Dorset County Council
1937
NHMS.VII/2/e/xiv

Above right

Flyer for a lecture on the wildflowers of Dorset

The Flora's League was started by Sir Maurice Abbot-Anderson of Lyme Regis in 1925 and expanded quickly, campaigning for the protection of wild plants. His wife Muriel took over as President after his death.
1937
NHMS.VII/2/a



In the showcase:

In the trenches, on the beaches

During the 1930s, Cyril Diver (1892–1969) carried out a major study of the Studland peninsula with the help of family and friends.

Diver's interest in the natural world had been sparked in the First World War, when he became fascinated by snails he found in the trenches on the Western Front. Diver got to know Studland when he visited his parents in Poole after the war. His survey of the flora and fauna of the area's sand dunes and heathland was one of the first of its kind. It was an early example of citizen science, where data is collected by the general public.

Helped by a large team of volunteers, the National Trust completed a comparative study between 2013 and 2015. It provided invaluable data on how the site's ecology has changed.

1

Quail and British black grouse (*Coturnix coturnix* and *Tetrao tetrix*)

Both birds like to live around the fringes of heathland. They were once present in Dorset, and quite plentiful in the early 19th century but were almost extinct by 1900. They were last recorded in Dorset around 1925 and are now only seen on northern uplands.

BC.83

2

Great bustard (*Otis tarda*)

These large birds were native to Britain and used to live on parts of Dorset's open grasslands. By the 1840s hunting and habitat changes had made them extinct in this country. Great bustards from Russia were reintroduced onto Salisbury Plain from 2004. Some have wintered on the Dorset coast.

V.1272

3

Spoonbill (*Platalea leucorodi*)

Spoonbill sightings in Dorset have increased in recent years – particularly around Brownsea Island. That's because warmer summers are encouraging these wading birds to move from continental Europe. This one was shot in 1880 by Charles Holland Warne, and prepared by Brighton taxidermists Pratt & Sons.

BC.82

4
Common buzzard (*Buteo buteo*)

Buzzards are among the most common birds of prey. Their numbers have increased dramatically in recent years thanks to a recovery in rabbit populations and controls over pesticide use. You can see them in the local countryside – soaring in the sky or sitting on telegraph posts or fences.
BC.100

5
Purple swamphen (*Platalea leucorodia*)

Birds are often caught up in unusual weather events that can carry them a long way from home. The nearest natural habitat of the European purple swamphen is Spain and the south of France. Major Charles Robert Eustace Radclyffe claimed to have shot this specimen on the River Frome in 1908.
BC.69

6
Otter (*Lutra lutra*)

If you are patient you might spot an otter in a Dorset river. Britain's otter population fell drastically during the 1950s because of water pollution, but has grown again in recent decades. Otters are now a protected species. They normally have brown fur – this one faded while on display.
RD.2877

7
Badger (*Meles meles*)

Look out for badgers after dark, when these nocturnal carnivores find food. Concerns that they spread tuberculosis to cattle led to a controversial government-backed badger cull in Dorset from 2015. Many conservationists argue the cull risks spreading the disease, and that vaccinating cattle (and badgers) would be more effective, sustainable and publicly acceptable.

RD.2878

8
Cyril Day's collection of Dorset insects

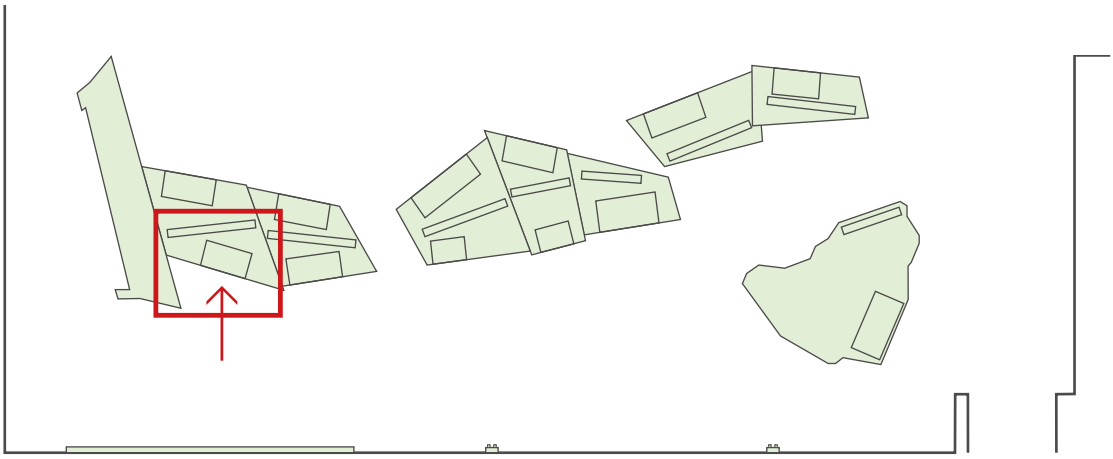
Cyril Day (1885–1968) was a keen amateur entomologist. Here are some insect specimens he collected, prepared and mounted. They are just a small part of his collection of 2,652 insects, representing the wide diversity of species commonly found in Dorset in the mid-20th century.

1952.32

Cyril Diver's research equipment

Diver and his team used this equipment for their study in the 1930s. It includes a water collector and tester, and a clipboard for recording information.

On loan from The National Trust



On the plinth:

Coastal

Where sea touches land

After the last ice age, melting ice led to huge changes in sea level. Chesil Beach, an 18-mile-long stretch of shingle, was created between 10,000 and 4,000 years ago, when the rising sea and storms pushed huge quantities of sand and pebbles towards the land.

The Dorset coastline is still changing. Weather and sea erode the cliffs and create rock ledges, rock pools, sand dunes and other features. These become new habitats for coastal wildlife.

This wildlife and its habitats are threatened by pollution and the many plastics that people use every day. In the future, longshore drift and rising sea levels caused by global warming are expected to have a dramatic effect on Dorset's coastline.

In the showcase:

Seasonal shelter

Around 8,300 years ago, a group of hunter gatherers made a camp at Culverwell on Portland. They used limestone slabs to build a floor and a shelter – and probably returned year after year.

The site was near the sea, but the sea level has risen since then, so it is closer to the coast now. A rubbish dump (midden) showed they ate foods like limpets, periwinkles and cockles from the cliffs and shoreline. Thousands of pick-like stone tools were scattered among the shells.

From left to right:

Microliths, shells, floor fragments and chert chisel.

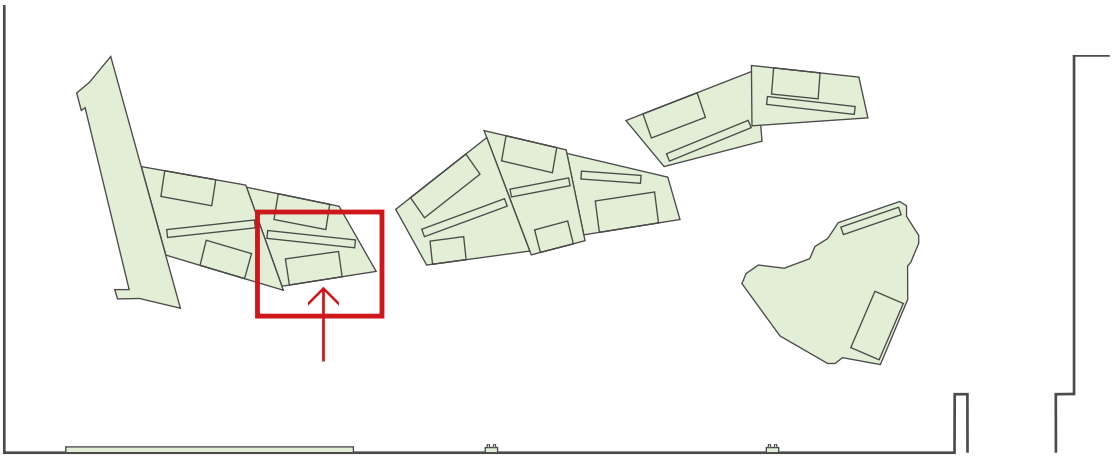
Culverwell, Portland
c.6,300 BCE
2020.11

Suspended above:

Northern bottlenose whale skull and vertebrae (*Hyperoodon ampullatus*)

The Swanage coastguard shot this bottlenose whale in 1855 after seeing it 'blowing' in the sea. Almost eight metres long and five metres wide it weighed around eight tonnes. When the whale was dissected it became evident that it was female and pregnant. A local man bought the carcass for the blubber, which produced 1,000 litres of oil.

DORCM.V.98



On the plinth:

Rivers and Streams

Web of water

Rivers and streams teeming with fish, plants, insects, birds and mammals flow across Dorset from the hills and through estuaries to the sea.

Some are crystal-clear chalk streams. Others are winterbournes – waterways that run dry in the summer months. All this high quality water led to water meadows being widely developed and used for farming in Dorset from the 18th century.

More modern farming methods, particularly where water meadows have been lost or pesticides run off into waterways, have harmed species such as water voles, shrews and otters as well as insect life. This has contributed to a decline in their numbers. River restoration projects are now helping to bring back these important habitats for Dorset's water-loving plants and animals.

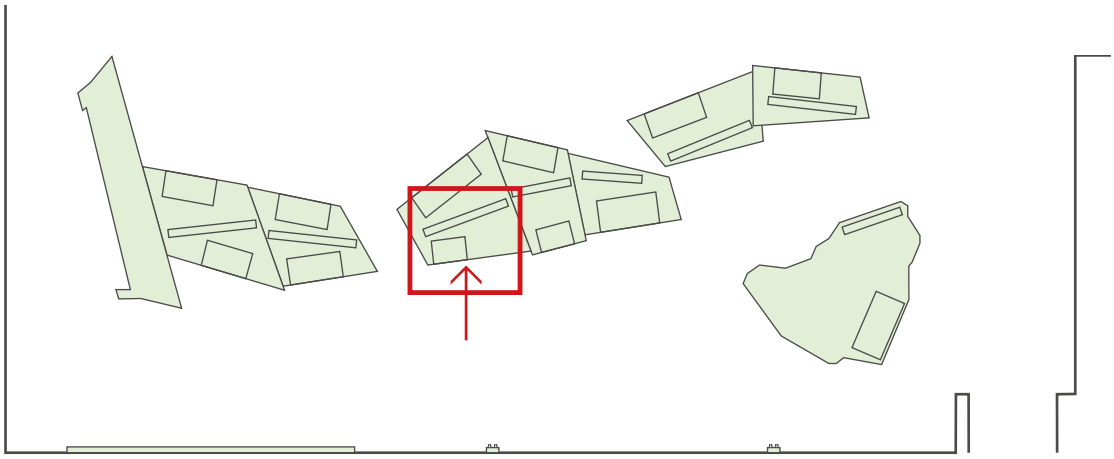
Severing connections

Please touch

Axes like this one on your right were made and used from around 474,000 to 427,000 BCE by *hominins* (human ancestors), probably *Homo heidelbergensis*. Many axes were later washed into giant ancient rivers such as the now silted-up River Solent. They were deposited in the gravels and some have since been discovered in Corfe Mullen and the Broom valley.

These types of axe had no handle and were designed to be gripped in the hand. Different parts of the axe did different jobs – the rounded part was used for smashing, the point for gouging and the edges for slicing.

Hand axe
Broom
2005.35



On the plinth:

Woodland

Woodlands full of wildlife

Dorset's woodland began growing about 10,000 years ago as the warming climate enabled plants to gradually spread north, creating woodland habitats for wildlife.

You can find all five types of woodland in Dorset – broadleaved, acid, wet, mixed and plantation. Hedgehogs, badgers, dormice, bats and five types of deer live in them. Most species arrived soon after the woods were established, but some have been introduced more recently.

Over thousands of years people have shaped the woods, felling, coppicing and pollarding trees. More recently the variety of wildlife in Dorset's woodlands has been threatened, as these traditional woodland management techniques have declined and non-native species such as conifers have been planted.

In the showcase:

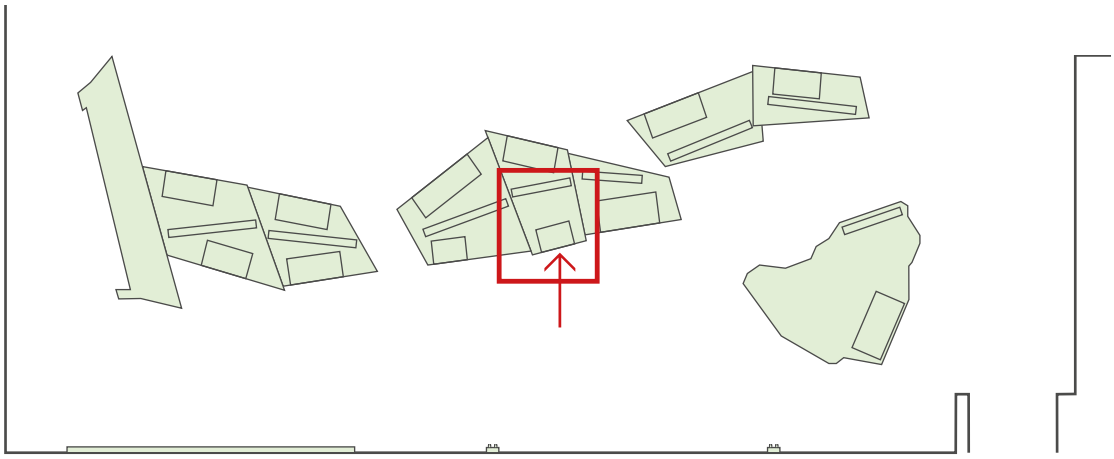
Into the woods

As woodlands spread between 10,000 and 4,000 years ago, Mesolithic people developed new hunting strategies and equipment to suit the changing landscape. Bows and arrows allowed them to shoot from a distance in dense vegetation. They mounted these small flints on wood to create a barbed arrow that would stick in an animal's hide.

From left to right:

A whetstone, probably used to sharpen tools, and flint microliths and cores.

Iwerne Minster, Cranborne Chase
c.10,000–4,000 BCE
RD.1646



On the plinth:

Heathland

Out upon the heaths

Dorset's colourful heathland used to be woodland growing on infertile, acidic and dry soils. Beginning in the Neolithic period around 6,000 years ago, people cleared the woods to graze livestock, and these light soils began eroding.

The soils deteriorated further when trees were removed by later Bronze Age farmers, but this suited heathland plants such as heather and bracken. Heathland was later used for grazing, and turf and peat were cut and burnt for fuel.

Dorset's heathlands today are much smaller than they were in the past – just 15 percent of their size in 1750. They are home to many important kinds of wildlife including birds, invertebrates, reptiles and plants. As traditional farming uses for heathland have declined, many areas were lost to scrub and woodland, or destroyed. The survival of Dorset's heathland now depends on humans to protect and manage it.

In the showcase:

Felling the trees for grazing

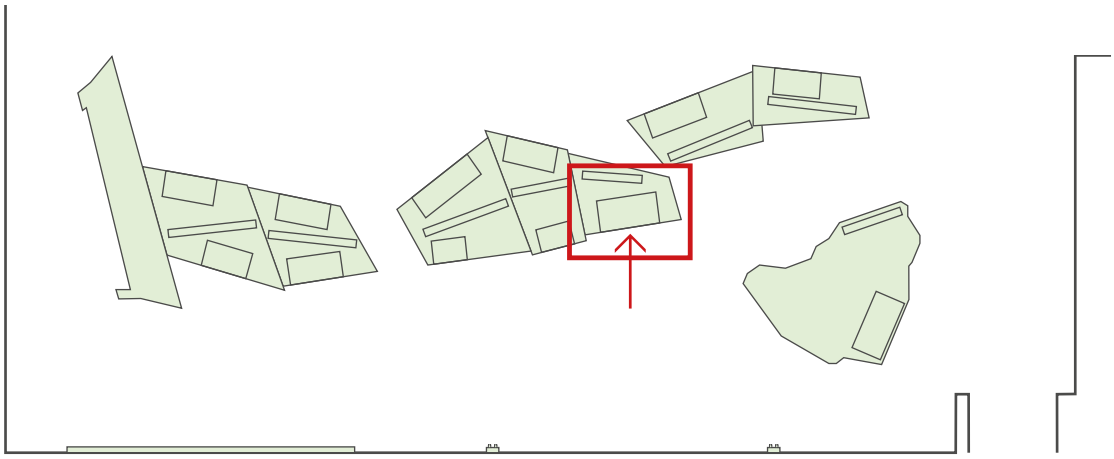
These axes were used by some of Dorset's first farmers, who started clearing woodland during the Neolithic period, from about 6,000 years ago.

Cutting down scrub and trees led to new landscapes – grasslands or heathland, depending on the type of soil. People brought domesticated cattle, pigs, sheep and cereal crops from Europe, and they all played a role in changing the ecology of the land.

Left to right

Ground stone axes

Made from a type of stone originating in Cornwall
Cranborne and Alderholt
c.4,000–3,300 BCE
1886.5.1, 1889.2.1



On the plinth:

Grassland

Fresh growth

Where woodland was cleared from chalk and limestone soils, grasslands developed. From the Neolithic period onward, people started building ceremonial monuments in these grassy spaces. You can still see some of them today.

Grasslands, particularly chalk grassland and traditionally managed hay meadows grown on neutral soils, are important habitats for wildlife. They support wildflowers, many kinds of birds and insects such as butterflies, grasshoppers and crickets.

The quality of grasslands has declined since the Second World War as farmers switched from natural to inorganic fertilisers and pesticides. Organisations such as Dorset Wildlife Trust and some farmers and landowners work to restore these important habitats.

In the showcase:

Ceremony in the landscape

Thickthorn Down long barrow was a monument built by Neolithic people. Some of these objects were found there and give us clues about the landscape and Neolithic lifestyles. The antler pick was possibly used in the barrow's construction, and the goat and pig teeth indicate the farming of animals. The land snails are from archaeological deposits and confirm that the area around the barrow was open, dry grassland.

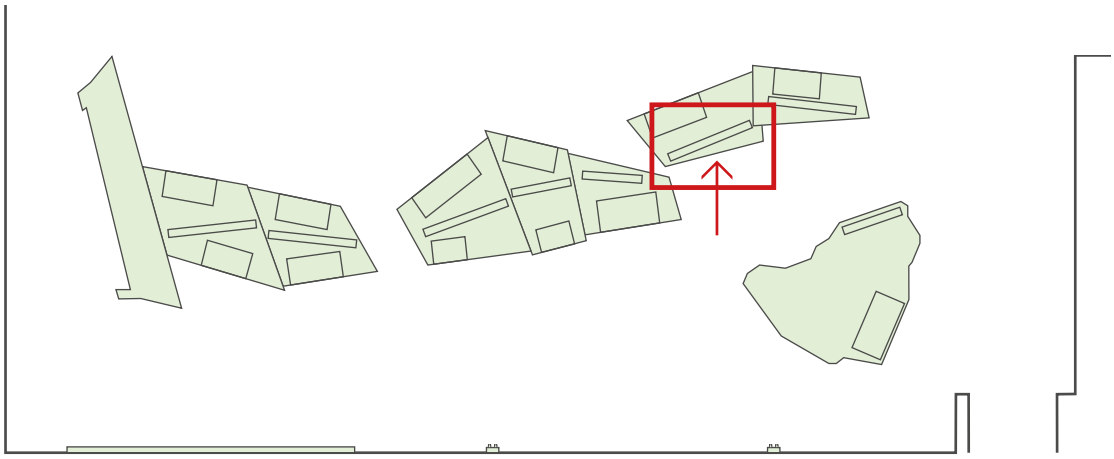
Left (from top to bottom)

Flint tools, mollusc shells, pig and goat teeth.

Right

Antler pick

Thickthorn Down, Gussage St Michael
c.4,000–3,300 BCE
1934.44



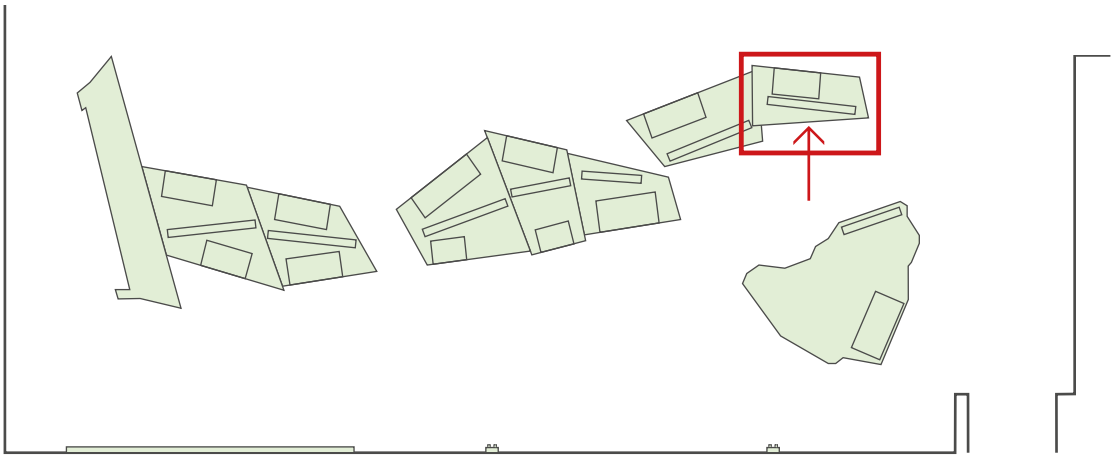
On the plinth:

Marine

Everything under the sea

Meadows of seagrass, forests of kelp, chalk reefs and gravel dunes sculpted by tidal currents are just some of the landscapes and habitats under Dorset's seas. They are home to a huge variety of life from fish, oysters and sponges to dolphins and whales.

For thousands of years people have used the Dorset seas as a resource – for fishing, transport or producing salt. Marine life has suffered in recent decades because of pollution and overfishing. Local residents, inshore fishermen and conservation organisations are working to help sea life thrive again in six Marine Conservation Zones off the coast of Dorset.



On the plinth:

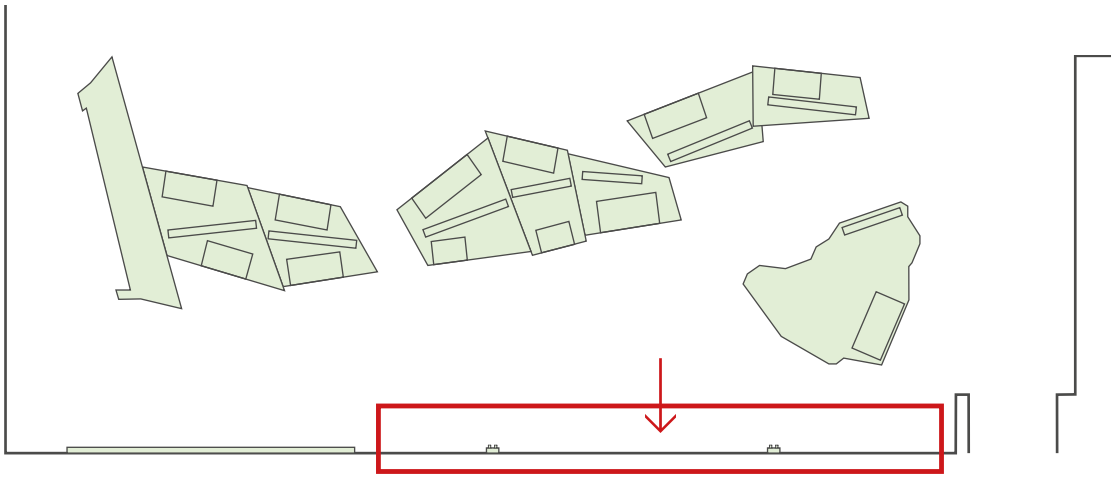
Underground

Going underground

Dorset's geology has provided natural resources for building, fossil fuels and everyday goods, such as ceramics and bricks.

Since prehistoric times people have quarried Portland and Purbeck stone, Kimmeridge shale and ball clay from Purbeck – materials that are used locally and exported around the world. There have also been major oil production sites at Wytch Farm and Kimmeridge in Purbeck since the Second World War.

These industries have helped to shape the lifestyles of Dorset people. They have also left their mark on the landscape. Over time some quarries have fallen into disuse and have become important habitats and havens for wildlife, including insects and wildflowers.



On the wall:

Dorset in mind

Encounters with the land

Dorset attracts people from around the world – writers and artists who want to capture its stunning scenery, those who explore its varied landscapes through physical activity, and those who just want to enjoy its peace and beauty.

The writing of William Barnes and Thomas Hardy brought attention in the 19th century to the Dorset countryside, and the deep connections rural people have to it. 20th-century writers such as Enid Blyton and Ian McEwan found inspiration in Dorset's coastline.

Local and visiting artists are fascinated by the county's sweeping coast and rolling hills. Hardy's evocative descriptions inspired more artists to paint here from the late 19th century, just as railway links were improving. Growing numbers of tourists arrived too, on the trains and later in cars, heading mainly for the seaside.

As modern life becomes ever more stressful, spending time in Dorset's special and largely rural landscapes gives people a way to reconnect with themselves and the natural world.

On the wall from left to right:

Dorset Quarrymen, Three Workers

Looking at the red skin of these three men against the glaringly white chalk, you can almost feel the backbreaking physical labour of working outside in Dorset's quarries.

Alfred Palmer studied art in London and Paris. Working for British Intelligence in the First World War, he sketched German prisoners at their camp at Yatesbury in Wiltshire. Later he moved to Swanage, inspired by the contrasting light on the Purbeck Hills.
Alfred Palmer (1877–1951)
Oil on canvas
1940s
ART.2329

View towards Portland, Dorset

This scene, from a high point above Lulworth Cove in Purbeck, offers a serene view of boats and the Isle of Portland in the distance to the west. Edward Pritchard, who was born in Bristol, painted a number of charming scenes of the Dorset coastline.
Edward Francis D Pritchard (1809–1905)
Oil on canvas
c.1880
2003.89

The Undercliff, White Nothe, Dorset

A misty Dorset coastline peeks through trees and undergrowth on the undercliff of White Nothe, a chalk headland near Ringstead Bay.

Landscape and portrait painter Catherine Ouless was also a keen geologist. This painting reflects her deep affection for Dorset's coast. The Museum also has a small collection of fossils she found in the Ringstead Bay area.
Catherine Ouless (1879–1961)
Oil on canvas
1920
ART.2272

Landscape Impression

Anthony Brown (1906–1987)
Oil and acrylic on board
c.1973
ART. 2231

Ancient Landscape

Dorset's prehistoric landscape is expressed through colour, shapes and angular lines in this abstract painting.

George Dannatt and his wife Ann were drawn to Dorset by a deep love of Thomas Hardy's work and the Wessex landscapes he described. They visited at first, then moved to the county permanently in 1981. Dannatt had trained as a chartered surveyor and took up painting professionally in his forties.
George Dannatt (1915–2009)
Oil on board
1982
2003.147

Beach scene, Dorset

James Fry was fascinated by the play of sunlight on the sea, by waves breaking on rocks, by sunsets and sunrises and reflections on water.

Born in Hertfordshire, Fry studied at the Watford School of Art. After moving to Corfe Castle he cycled around the area to paint scenes of heathland, cliffs and sea. He painted on hardboard because it was easier to carry on a bicycle than a canvas.
James Fry (1911–1985)
Oil on board
Mid-20th century
ART.2218

Sound point:

Experiencing the landscape

The Dorset landscape is a special place. Listen to stories of how Dorset people experience it, through work, creativity or movement.

Working in the landscape

Martin Green is a farmer and amateur archaeologist with an intimate knowledge of the ancient landscape of Cranborne Chase.

Creating in the landscape

Louisa Adjoa Parker is a poet and writer of Ghanian and English heritage who lived for many years in Dorset. She is now based in Somerset.

Moving in the landscape

Vickey Stephen swims wherever she can, in rivers, lakes or at one of her favourite places, Ringstead Bay.

Sound point:

Experiencing the landscape

The Dorset landscape is a special place. Listen to stories of how Dorset people experience it, through work, creativity or movement.

Working in the landscape

Ali Tuckey is a ranger working at the Durlston Country Park at Swanage.

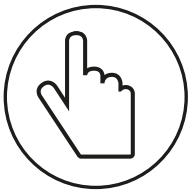
Creating in the landscape

Isla Chaney is a Dorset-based sculptor whose work explores the relationship between geology and man-made materials.

Moving in the landscape

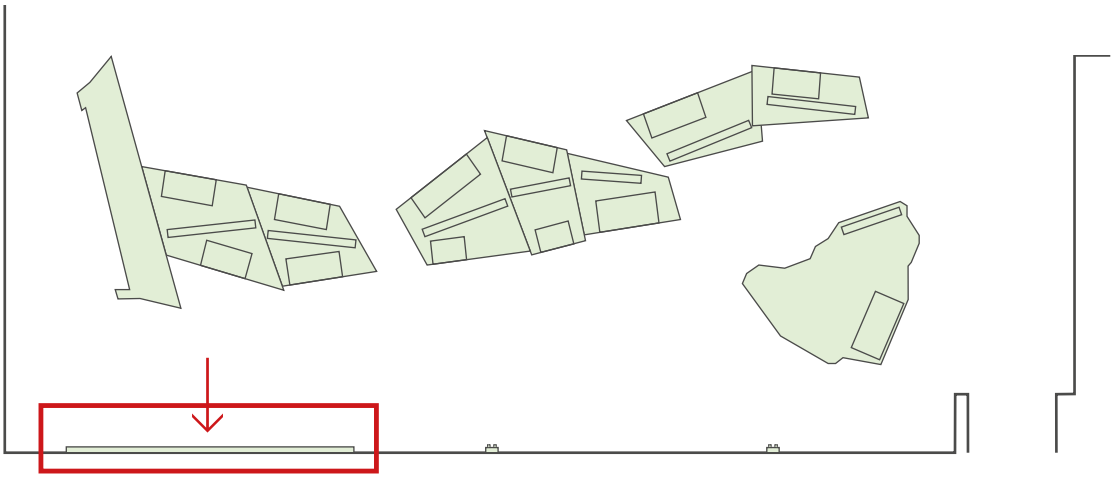
Steph Aburrow is a project worker with Stepping into Nature, who encourages those with dementia to experience the outdoors.

Please touch



Core samples

Inspired by the geology of the South Dorset Ridgeway, this sculpture consists of two imagined core samples taken from below the ground, made up of various rocks and deposits including sandstone, mudstone, chalk and clay. The top layer shows what is likely to be left by modern humans in the fossil record – a mixture of non-biodegradable plastic including toothbrushes, LEGO® toys and cup lids.
Isla Chaney MA, RCA
2015
2020.2



On the wall:

Dorset's future is in your hands

Living in the Anthropocene

Many scientists say that we have entered a new geological epoch – the Anthropocene. It is defined by the actions of humans, who have shaped and changed the Earth at a dramatic and global scale.

Geologists and activists question what evidence of our lives will be left behind millions of years from now. The possible answers are alarming. They include radioactive waste, incredible numbers of bones from livestock animals (such as cows and chickens), landfill rubbish and pollution from plastics, which have taken thousands of years to degrade.

How does knowing there will be evidence of our lifestyles in the fossil record affect you?

Could it change how you behave now and in the future?

How do you think Dorset will be affected?

Communities in action for Dorset

Across the county, organisations and local groups work to raise awareness of how human activity affects our local, national and global environment. In this changing display you can find out about some of these groups and the work they are doing. If your group would like to be featured, please get in touch.

Eco-Schools

Damers First School in Dorchester is part of the Eco-Schools programme, which gets the whole school and the wider community involved in environmental projects. The pupils lead activities such as campaigning for a plastic-free Dorchester, community gardening and recycling. They have won national awards and have helped spread enthusiasm for their eco work across the world. Isla, a pupil at the school, says 'Eco club has given me a voice and I feel like I can share my voice with other people.'