El registro fósil es como una enciclopedia de la historia de la vida en nuestro planeta.

Colecciones

¿Qué es un fósil?

Por Emily Osterloff y Lisa Hendry

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Los fósiles son evidencia física de animales y plantas prehistóricos. Nos revelan la historia de nuestro planeta, desde el clima y la evolución hasta la dieta y las enfermedades.

Es posible que estos restos prehistóricos contengan mucho más de lo que jamás imaginaste.

Cuando un organismo muere y queda rápidamente cubierto por capas de barro, arena o limo, tiene el potencial de convertirse en un fósil.

En lugar de descomponerse, algunas partes de su cuerpo son reemplazadas por minerales. En algunos casos, como en el caso de los animales pequeños de cuerpo blando, este proceso puede tardar solo meses o incluso días. En el caso de los animales más grandes, como los huesos **de dinosaurios** , la fosilización puede tardar miles de años.

Descubra más sobre cómo se forman los fósiles.

Hay más de un tipo de fósil. Dos tipos clave son los fósiles corporales y los fósiles traza.

¿Qué es un cuerpo fósil?

Los restos fosilizados de plantas y animales muertos se conocen como fósiles corporales. Estos pueden incluir huesos, garras, dientes, conchas, troncos y hojas fosilizados.

¿Qué es un fósil traza?

Otros signos fosilizados de una planta o un animal se denominan trazas fósiles. Estos pueden incluir huellas de piel o plumas, **huevos y nidos** , y material orgánico como excrementos, denominados **coprolitos** .

Los fósiles traza también pueden ser un registro de una actividad prehistórica, como **huellas, senderos** o madrigueras.

¿Qué es un subfósil?

Los subfósiles son fósiles en formación. Son restos que han iniciado el proceso de fosilización. Los minerales han comenzado a reemplazar los componentes biológicos.

"Se encuentran en algún punto intermedio del proceso", explica nuestro investigador de dinosaurios, **el profesor Paul Barrett** . "Suelen ser fósiles bastante

jóvenes, a menudo de depósitos de la Edad de Hielo o incluso más jóvenes".

Tanto los fósiles corporales como los fósiles traza pueden ser subfósiles.

Los dientes de tiburón son los fósiles vertebrados más abundantes. Este gran diente perteneció a un **megalodón** , una especie de tiburón extinta que pudo haber alcanzado los 24,3 m de longitud. Se extinguió hace unos 3,6 millones de años.

¿Qué es el registro fósil?

El registro fósil se refiere a todos los fósiles que conocemos de las rocas que nos rodean.

“Va desde que aparecieron los primeros organismos unicelulares hasta los **ancestros de los humanos** actuales y los mamíferos de la Edad de Hielo”, explica Paul.

El registro fósil nos revela qué plantas y animales existieron en diferentes momentos de la historia de la Tierra. En conjunto, constituye una enciclopedia de la historia de la vida.

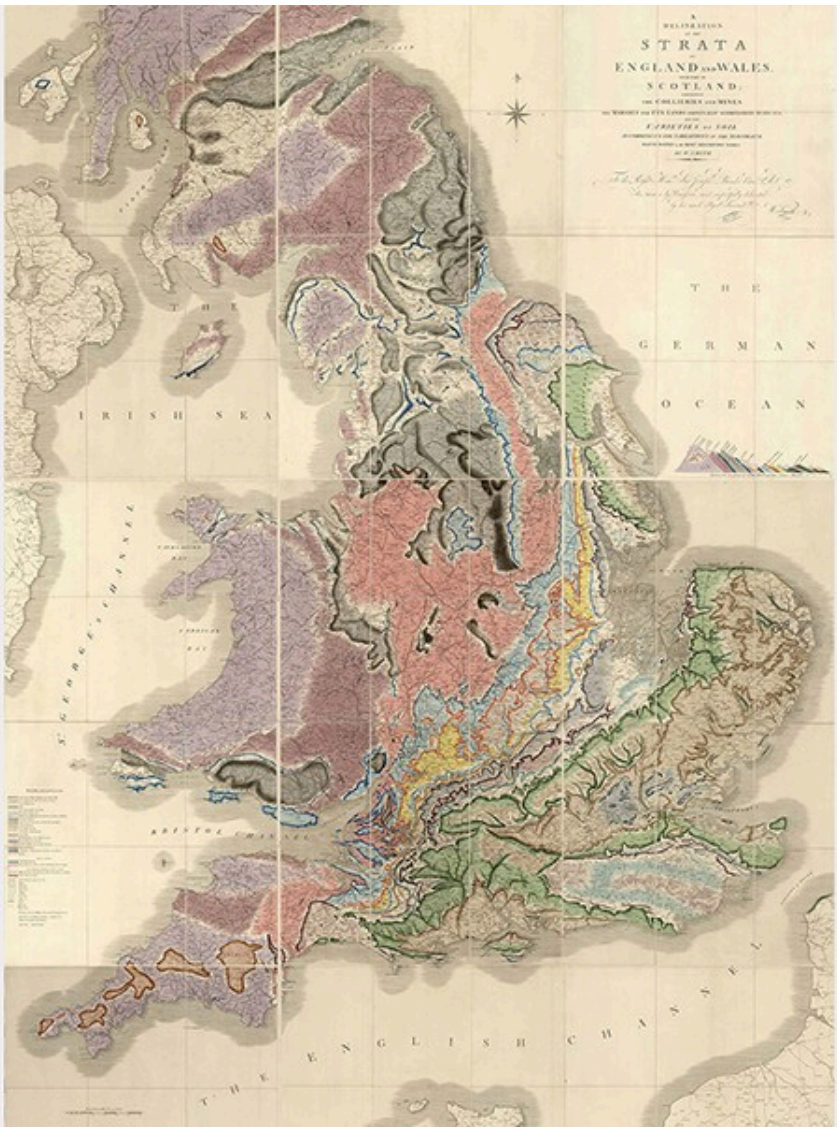
¿Dónde se encuentran los fósiles?

Se pueden encontrar fósiles en cualquier lugar que tenga rocas de la edad y el tipo adecuados. Los fósiles suelen encontrarse en rocas sedimentarias, que se forman cuando la arena, el limo, el lodo o las **conchas** de carbonato de calcio de las criaturas marinas se depositan en capas que luego se compactan.

“We have fossils from animals going way back to almost a billion years in time, all the way through to the present,” says Paul. “Everywhere that there are rocks laid down in conditions that allow fossilisation, there's a chance of finding a fossil.”

What kinds of fossils are in an area depends on the location, type and age of the rock. For example, Britain’s White Cliffs of Dover are **Late Cretaceous** chalk rocks. Chalk is laid down in marine environments. So, in these iconic cliffs we find fossils of ocean-dwelling animals. Ones that lived at the **end of the age of the dinosaurs**.

To find the right spots for fossil hunting, **palaeontologists** use geological maps. These show the rock layers in a given area. This can provide clues on whether there are fossils hidden beneath the surface and what kinds of organisms they might be.



The **first geological map of Britain** was produced by William Smith in 1815. It paved the way for a better understanding of geological time.

What is an index fossil?

Index fossils are used to work out the age of sedimentary rocks. They're chosen on the basis of being very common fossils that are found only in rocks laid down in a narrow period of time.

When we find an index fossil in rocks in different locations, it tells us that the rocks formed around the same time.

Ammonites make great index fossils due to their rapid evolution and wide distribution. So do **trilobites**.

Trilobites first appeared around 520 million years ago, and they survived for more than 250 million years. In that time more than 20,000 species evolved.

What can fossils tell us?

People have been finding fossils for a very long time. These objects were often misidentified in the past. For example, ammonite shells were once thought to be **coiled snakes turned to stone**, and some trilobites were mistaken for butterflies.

Scientists now know what fossils are and can use them to understand the history of life on our planet.

"Fossils can tell us a lot about not only what an animal looked like but also potentially how it behaved. An animal fossil might include, for example, the preservation of its gut contents, telling you about its diet," explains Paul.

Take the **spinosaur *Baryonyx***. The shape of this dinosaur's skull and teeth suggest the animal evolved to hunt fish. It might have used its enormous claws to hook food out of rivers, similar to how a grizzly bear fishes for salmon. However, the discovery of ***Iguanodon*** bones in what's thought to be fossilised *Baryonyx* stomach

contents, alongside fish scales, suggests this dinosaur's diet may have been more varied.

We can sometimes see behaviour in fossils too. For example, a fossilised specimen of *Citipati osmolskae* sitting on a nest of eggs shows us that some **dinosaurs were probably protective parents**.

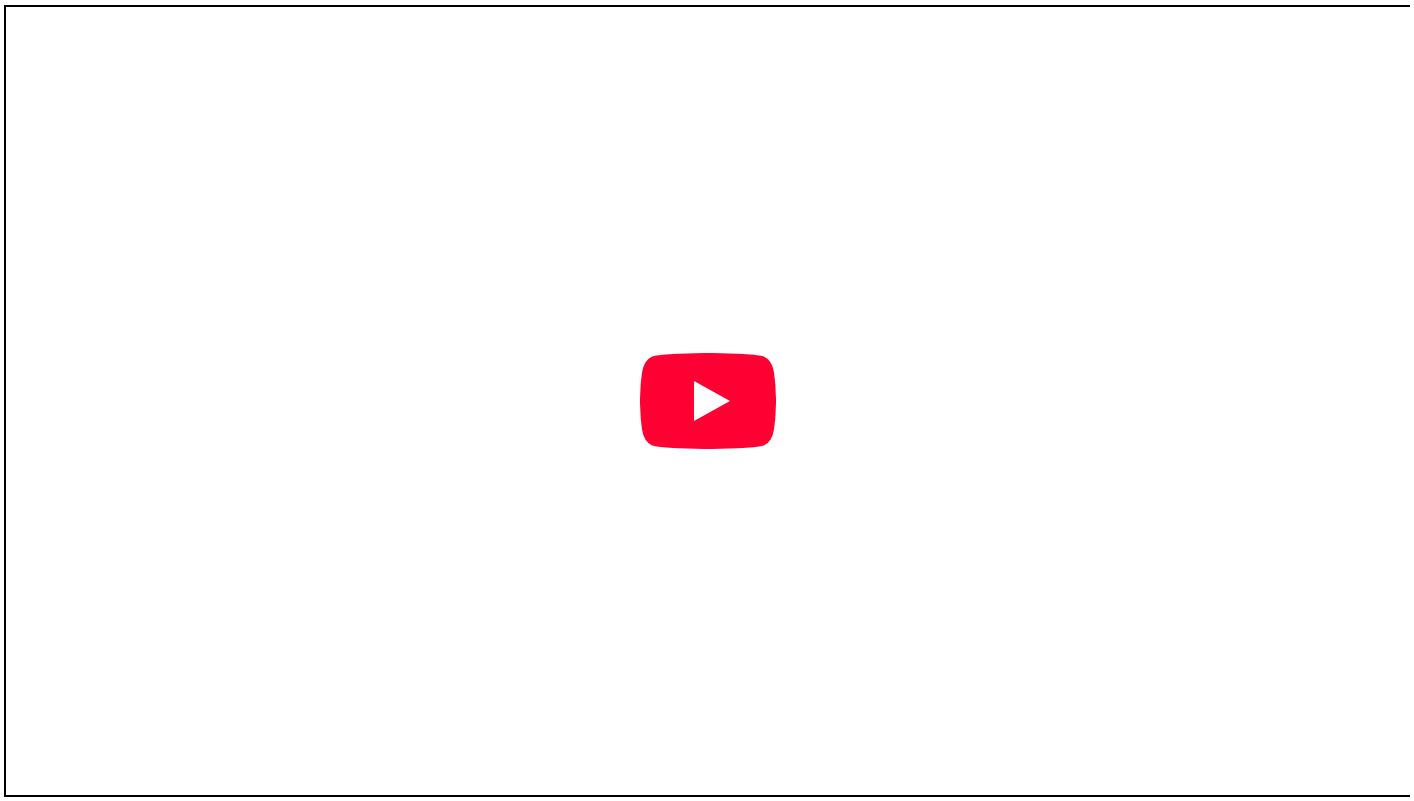
Without bones nearby, we can't be certain what species made these fossilised footprints. But trace fossils such as these can provide behavioural insights. They tell us where an animal was at...

Read more

Fossils may also reveal breakages from fights or other traumas, or even evidence of disease. For example, lesions on sauropod neck bones from Montana have been interpreted as **evidence of airsacculitis** - an inflammatory disease that still affects birds today.

Many fossils are so small that we need to use microscopes to study them. We use the name microfossil to refer to any that are less than one millimetre across. These can be fossils of whole organisms or fragments of them, such as bits of bone or **tiny teeth**.

Microfossils may be small, but they can provide us with lots of information about the past. For example, we can learn about past climates from tiny shells.



Dr Lyndsey Fox explains how scientists can learn about the past from ancient microorganisms. **Watch this video with audio description (1 minute 11 seconds)**.

Fossils don't tell us the whole story, however. Soft tissues and organs don't usually fossilise. So, while fossils of trilobite exoskeletons and ammonite shells are common, evidence of their soft parts aren't. Fossils of these parts would allow palaeontologists to gather much more data about the lifestyles and biology of prehistoric animals.

As hard parts, such as bones or shells, are more likely to preserve than soft-bodied organisms, the snapshot of prehistoric life that we get from fossils can be quite biased. It's also not usually possible to determine an animal's colour from its fossil, although there are some **rare exceptions**.

Despite the incomplete nature of the fossil record, fossils provide us with evidence of evolution. We can use them to observe how life on Earth has changed over time. Transitional fossils are particularly useful.

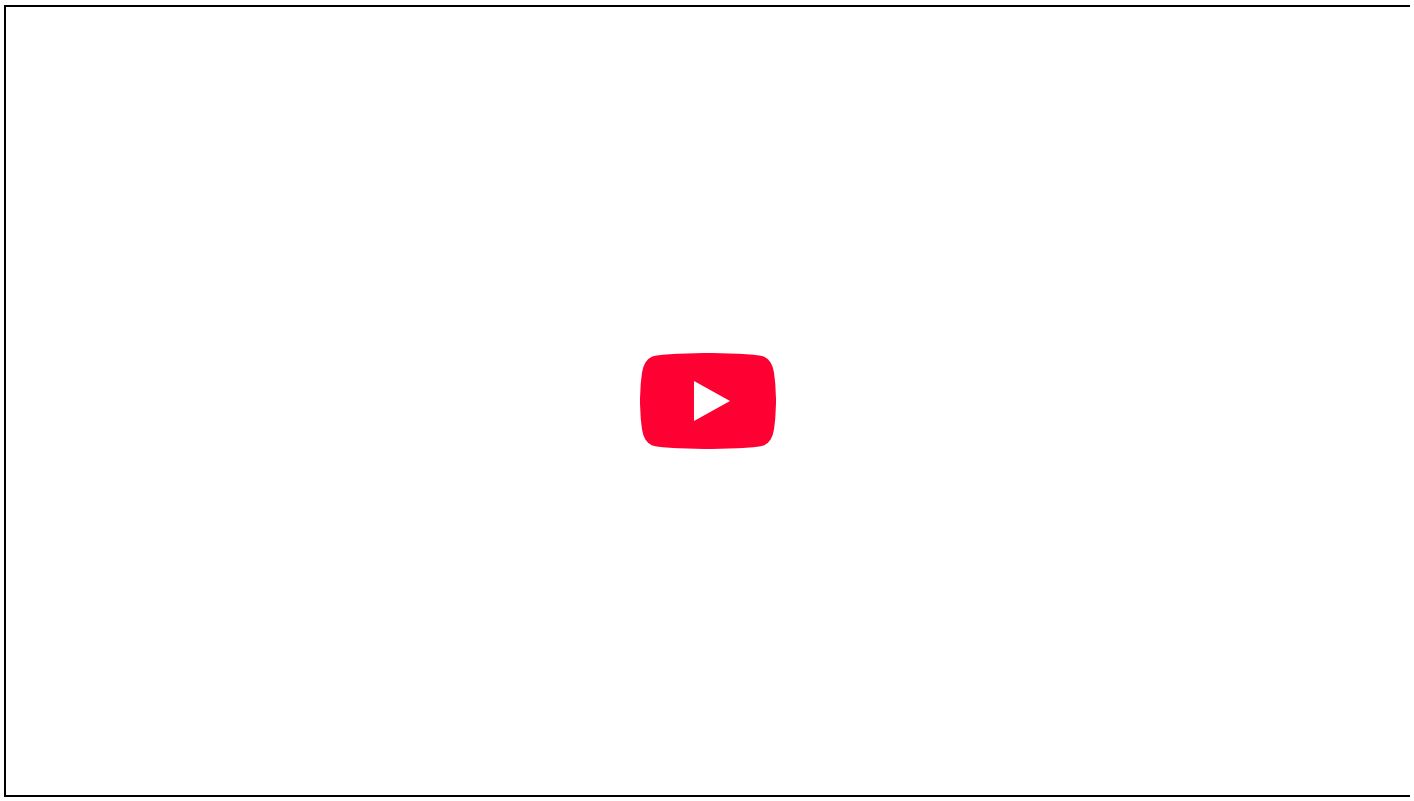
What are transitional fossils?

Transitional fossils are specimens that have traits of their ancestor species and the species that descended from them. They give us clues about how evolution occurred.

The Late Jurassic dinosaur ***Archaeopteryx*** is a possible transitional fossil between non-avian dinosaurs and birds, for example. This animal had features in common with modern birds, such as feathered wings and a small body. But it also had dinosaur-like features, such as sharp teeth and a long, bony tail.

This is a cast of the iconic Berlin *Archaeopteryx* specimen. The London specimen - the first *Archaeopteryx* skeleton ever recovered - is on display in our **Treasures Gallery**.

Another example of a transitional fossil is *Pakicetus.* It's thought to be one of the first cetaceans - the group of marine mammals that includes dolphins, porpoises and **whales**. While *Pakicetus* had four limbs and lived on land like its ancestors, fossils also show that it had evolved ear bones that are unique to whales today. This tells scientists that *Pakicetus* is very likely part of the evolutionary pathway to cetaceans.



Discover how four-legged, land-dwelling animals evolved into modern-day whales. **Watch this video with audio description (1 minute 9 seconds)**.

Are fossils fragile?

If circumstances are just right and animal or plant remains become fossils, they can survive underground for millions of years. Despite this, fossils can be quite fragile.

“It varies, depending on the type of rock the fossils are made of and were preserved within,” explains Paul.

“Some fossils are really tough, and others are extremely delicate. They can be brittle and snap quite easily, particularly if you remove the rock from around them, leaving just the structures of their shells or skeletons behind.”

Palaeontologists and **fossil preparators** must be very careful while they’re excavating fossils and preparing them for display or research collections. They use a variety of techniques and tools, including using adhesives, to hold fragile and broken specimens together.

Like animals, plants from our planet's past sometimes fossilise. You can find these fossil trees in our **Hintze Hall**. They're between 25 million and 385 million years old.

Fossils containing certain minerals can be particularly fragile. For example, when crystals of iron pyrite, which is also known as fool's gold, form in fossils it can have a dramatic effect. **Paul describes it** as making "bones or shells explode in slow motion."

Pyrite oxidises when it comes in contact with air or moisture, and it can cause a fossil specimen to disintegrate. It's sometimes known as pyrite decay or pyrite disease.

To protect at-risk fossils, we limit their exposure to air and humidity by storing them in air-tight boxes or bags. Pyrite oxidation can't be reversed, but the effects can sometimes be neutralised by conservationists.

Is this a fossil?

Have you discovered an object and want to know whether it's a fossil? Contact our Identification and Advisory Service in the **Angela Marmont Centre for UK**

Nature to learn about your find.

Identify your specimens

Ahora ya sabes qué son, aprende **a encontrar fósiles en la playa** .

Explora las colecciones

Desde mamíferos fósiles gigantes hasta polillas misteriosas, descubra las coloridas historias detrás de algunos de los especímenes más fascinantes del Museo.

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Dinosaurios

¿Cómo se forman los fósiles de dinosaurios?

Aunque los dinosaurios vivieron hace millones de años, los conocemos gracias a los fósiles. Mira nuestra animación para descubrir cómo se formaron los fósiles de dinosaurios.

Dinosaurios

Cómo encontrar fósiles de dinosaurios

Descubra cómo los paleontólogos encuentran y desentierran reptiles prehistóricos.

Dinosaurios

Huellas de dinosaurios: ¿cómo se forman y qué nos pueden decir?

Los huesos de dinosaurio no son la única forma en que podemos aprender sobre

Colecciones

Mary Anning: La heroína anónima del descubrimiento de fósiles

Mary fue una paleontóloga pionera y coleccionista de fósiles. Su vida fue una constelación de primicias.

los antiguos reptiles que alguna vez vagaron por nuestro planeta.

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