

The Fossil Girl



*She sells seashells on the seashore
The shells she sells are seashells, I'm sure
So if she sells seashells on the seashore
Then I'm sure she sells seashore shells.*

Have you ever heard this tongue-twister? Did you know it was written in honor of a real girl? She really did sell seashells and other things she found on the shore; but more importantly, she can be called one of the first and most important paleontologists- even though most people have never heard of her!

Mary Anning was born in 1799 in the small town of Lyme Regis, along the southern coast of England. Mary's family lived in a house very close to the seashore, and they were very poor. Mary's parents had ten children in all, but only Mary and her older brother Joseph survived childhood. In fact, Mary was actually named after her parents' first child, a little girl who died tragically at the age of 4. She had been playing near the fireplace one day, and apparently got too close to the fire; her clothes caught on fire, burning her so badly that she died. Her mother, who was pregnant at the time, was so distraught over the loss of her first child, that when her new baby arrived only 5 months later, she named the new baby Mary as well.

Mary herself nearly died only 15 months after birth. One rainy day, the townspeople were watching a parade in the village. A woman who



Lyme Regis, England

was the Annings' neighbor was holding baby Mary, chatting with two friends, while standing under a tree to stay out of the rain. Suddenly, with a loud CRACK!, a bolt of lightning struck the tree. All three women were killed instantly. Mary appeared to be dead also, but she was rushed back to her house where she was revived in a bath of warm water.

Mary's miraculous survival convinced many people in the town that she would be very special someday. And indeed, Mary grew up to be an unusually curious, intelligent and very lively child, with a wonderful sense of humor. Although she lived in a time when girls were rarely allowed to go to school- and *never* allowed to go to college- Mary was able to learn to read and write at her church Sunday school. She read whatever she could find, and was especially interested in the new science of geology.

Mary's father was a cabinetmaker who struggled to provide for his family. Life was difficult in their house by the sea. It was said that when the sea was particularly rough, the waves would come right up to the house; on one occasion the waves came crashing into the house and the family only escaped drowning by climbing out an upstairs window.

Mary's father, like many of the people in town, tried to earn some extra money by collecting fossils on the beach to sell to tourists who occasionally visited the town. Although people at the time did not know it, the cliffs near the town were made from layers of sedimentary rock that had formed during the Jurassic Period about 200 million years ago, when a shallow sea covered all that part of England. The layers of dark limestone and shale that once formed the ocean floor could easily be seen in the cliff face, and during the rainy winter months there would be frequent landslides that would spill heaps of broken rock down onto the beach.



Fossil collectors had to risk the crashing ocean waves and threats of continued landslides to search through the broken rocks looking for fossils- and they had to act quickly, for once the high tide came in a few hours later, the newly exposed rocks could be swept out to sea.

Mary's father would take Mary, her brother Joseph, and their mother out to the cliffs to search for interesting specimens to sell. Mostly they found fossil ammonites and belemnites, two kinds of ancient shelled animals. Occasionally they would also find larger bones and skeletons, but at the time nobody understood what they could be.



Ammonite fossil



Belemnite fossils

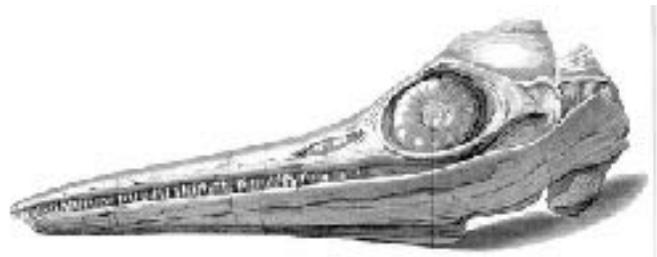


Belemnites and Ammonites were relatives of the squid that lived 200 million years ago.

When Mary was only 11 years old, her father was very ill with a dangerous lung disease called tuberculosis; then one day while searching for fossils he had a fall on the cliff which caused serious injuries. Shortly afterward he died, leaving Mary, her brother Joseph (who was 14) and their mother with no financial support, except for the little money they made selling fossils and shells from a table they set up in front of their house each day.

The following year, Joseph discovered a large skull about 4 feet long. He was unable to find any more remains from the animal, but he told Mary where he had found it, and she continued searching until she uncovered the rest of the skeleton, which was 17 feet long! The animal turned out to be the first correctly identified *ichthyosaur* skeleton ever found. Up to that time, people had only found bits and pieces of these animals, and incorrectly thought them to be ancient crocodiles. From Mary's fossil, they could see that the *ichthyosaur* ("fish-reptile") was actually an animal very different from anything alive today. It had features that are common to some other reptiles, but its shape was more like a huge dolphin.

This discovery was very puzzling for scientists who heard of it. It would be another 50 years before Charles Darwin would figure out the Theory of Evolution, explaining how living things had changed over vast periods of time. In 1811, most people still believed the world had been created suddenly, just a few thousand years ago.



Ichthyosaur skull found by Joseph

People thought that all the animals alive today were the same as animals that had always lived in the past. Yet Mary's *ichthyosaur* fossil showed an animal that was nothing like any animals living today. This started many scientists wondering what other strange creatures might have existed long ago.

Mary and her family sold the *ichthyosaur* skeleton to a wealthy gentleman for 23 pounds (that would be over \$2,000 today). He later sold it to the British Museum for more than twice as much. Still, the Anning family continued to struggle. In 1820, when Mary was 21, a wealthy collector who had bought many fossils from the Annings decided he wanted to do something to help this poor family who had provided so many amazing specimens for him. He advertised a great auction, and sold off everything he had bought from the Annings. He raised over 400 pounds (equivalent to \$40,000 today) which he gave to the Annings. Not only did this lift the family out of their financial difficulties, but it also brought many European scientists to the auction who became regular customers of the Annings' fossil shop.

Mary's mother stopped collecting fossils at some point after her husband died. Not long after that Joseph found another job. Mary gradually took over the family fossil business. With her growing interest in fossils, she would read any books and scientific articles she could find, and became friends with many of the wealthy and educated people who came to visit Lyme Regis. Sometimes she borrowed scientific papers from the geologists who bought fossils from her. She would copy the papers out completely by hand, adding her own expert comments and detailed drawings. Mary also practiced dissecting modern sea animals so that she could learn more about the anatomy of the fossilized creatures she was finding.

Among her discoveries, Mary solved the puzzle of mysterious cone-shaped rocks that were often found near large animal fossils. When she broke open these rocks she found the partially digested remains of small sea creatures. Mary deduced that these rocks were actually fossilized dung from the large sea animals that lived long ago. These fossilized droppings were named "coprolites", and today they are very important in helping scientists understand ancient ecosystems. Mary also discovered that ancient belemnites



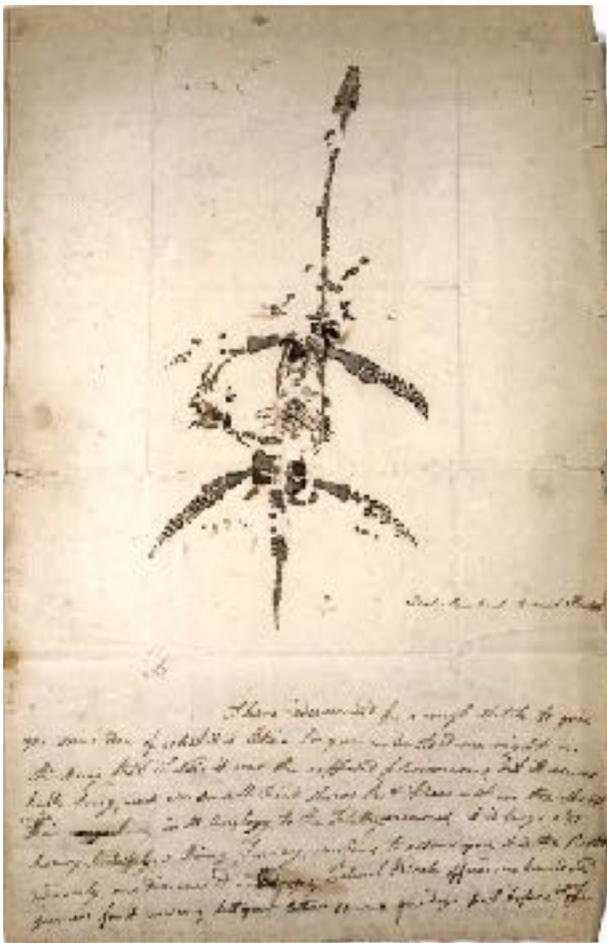
Mary and her little dog, Tray

had sprayed “ink” into the water as a defense, just like their descendants today, the squid. Mary found fossilized ink in some of the belemnite shells, and she learned that she could grind it into powder, mix it with water, and actually use the ink to write or draw!

Mary continued to make important discoveries, and many famous scientists from Europe and America would come to Lyme Regis to buy her fossils, ask her advice, and sometimes even go out to the cliffs on fossil-hunting expeditions with Mary. Unfortunately, as an



Mary's rock hammer



Mary's letter and drawing describing a new species of Plesiosaur she discovered.

She was always accompanied by her faithful little dog, Tray. The risks of her efforts became very apparent one day when a cliff collapsed only a few feet in front of her, killing her beloved dog and nearly taking Mary's life as well.

uneducated woman, Mary was not allowed to join any of the scientific organizations at that time. Therefore she received no recognition for her work in the scientific literature. In fact, when fossils she had found appeared in museum collections, Mary was never given credit for her discoveries. Instead, the museum would only identify the wealthy gentleman who had bought the fossil and donated it to the museum.

However, Mary's reputation continued to grow among the scientists who knew her well. When she was 24 years old, she found the very first *plesiosaur*, another huge sea reptile, with four flippers and such a long neck that other scientists at first thought Mary must have made a mistake and mixed the bones of different animals. But eventually she found more *plesiosaurs*, and it became clear that she was correct. She also discovered the first *pterosaur* (a flying reptile) ever found in Britain.

Mary worked very hard and in dangerous conditions, hurrying out after each landslide with her little rock hammer, trying to find the precious fossils before the next tide came in.

By 1830, because of difficult economic conditions in Britain and fewer wealthy customers, Mary began having financial problems again. One of her geologist friends, Henry De la Beche, hired an artist to paint a picture of life during the Jurassic period. The painting, titled *Duria Antiquior*, included many animals that Mary had discovered. This was the very first known painting to show a scene of prehistoric life. Henry sold copies of the picture to other geologists and wealthy friends, and donated the profits to Mary. Shortly afterward, Mary made another major find, a new species of *plesiosaur*, and was able to sell it for 200 pounds.



Duria Antiquior

Mary continued collecting fossils and giving advice to visiting scientists until her 40's, when she became ill with cancer. Mary died from cancer at the age of 47.

Although Mary had played a very important role in the early years of geology and paleontology, she never got the credit she richly deserved during her lifetime. In those days, the highest honor a scientist could receive was to have a new species named for him. However, no British scientists named any species after Mary during her lifetime (although the famous Swiss-American scientist, Louis Agassiz, named two species of fossil fish for Mary: *Acrodus anningiae* and *Belenostomus anningiae*). After Mary's death, several other species of animals were also named in her honor. And today you can

go to the British Natural History Museum and see some of Mary's very best fossils on display, and read the story of this remarkable woman!



This sketch of Mary searching for fossils was made by her geologist friend, Henry De la Beche.

