

The Pit They Almost Filled In

PASSAGE · NON-FICTION

SKILLS TRAINED

Working memory

Delayed recall

Critical analysis

HOW TO USE THIS SHEET

About 22 minutes

- 1 Read the passage twice, slowly. Take about seven minutes.
- 2 Turn to the next page and cover this one. No looking back.
- 3 Write what you remember, then mark it on the last page.

A hole in the ground south of Frankfurt is one of the strangest libraries on Earth. It is about a kilometre wide, roughly sixty metres deep, and it contains no books at all. What it contains is flat grey oily rock, and pressed between the layers of that rock, like flowers in an album, lie the animals and plants of a forest that vanished forty-eight million years ago.

The forest grew around a lake, and the lake was not an ordinary one. Groundwater had met hot rock below, flashed into steam and blown a crater out of the surface; the crater then filled with water. Lakes of that kind are deep, steep-sided and almost completely still at the bottom, where no oxygen reaches and nothing lives to disturb what settles. Anything that sank into the mud of the Messel lake was neither eaten nor scattered. It was simply covered, year by year, by a fine dark sediment of dead algae.

Local people began digging the stuff out in 1859, not for its fossils but for its oil, which could be cooked out of the shale and sold. Mining went on for more than a century. It ended in 1971, and the district was left with an enormous empty bowl and an obvious use for it. The plan was to fill the pit with household rubbish.

What stopped the plan was a long, stubborn argument. Amateur collectors had been pulling remarkable things out of the discarded shale for decades, and they refused to be quiet about it. Scientists joined them, the legal fight dragged on through the 1980s, and in 1991 the state of Hesse bought the site outright. Four years later the Messel Pit became the first natural site in Germany to be placed on the UNESCO World Heritage list.

The fossils justify the fuss. Because the sediment was so fine and so undisturbed, Messel preserves the parts of an animal that almost never survive: the outline of fur, the shape of feathers, the shimmering structural colour still visible on a beetle's wing case, and in some specimens the contents of the stomach. One famous skeleton is a mare with a foal still inside her. Nine species of early horse have been described from the site, and they were nothing like a modern horse — the smallest stood about the height of a fox terrier and browsed on leaves and grapes rather than grass.

There is a catch, and it is a serious one. Messel shale comes out of the ground wet, and it will not stay whole. As it dries it curls, splits and finally crumbles into flakes, taking the fossil with it. For years that destroyed as much as the quarrying did. The answer was a technique that sounds like vandalism: a preparator uncovers the bones under a thin film of water, pours a layer of epoxy resin over the exposed side, lets it harden, and then turns the slab over and picks away every scrap of the original rock from behind. The fossil ends up embedded in clear plastic. The stone it lay in for forty-eight million years is thrown away.

Visitors arriving at the viewpoint today see a quarry. There is grey rubble, a fringe of birch scrub, a little water at the bottom, and no monument of any kind. Everything that made the place worth saving is either in a museum fifteen kilometres away or still lying flat in the dark, a few metres down, waiting for someone with a chisel and a very light hand.

Cover the passage before you start.

Looking back turns this into a copying exercise. Getting it slightly wrong from memory is what makes it work.

PART A Tell it back

Write down everything you can remember about the Messel Pit — how the lake formed, what was found there, and how the fossils are rescued. Order does not matter. Keep writing until you run out.

PART B 6 questions

- 1 In which year did mining at Messel stop, and in which year did the state of Hesse buy the site?

- 2 Why did the particular way the Messel lake formed matter so much for the quality of its fossils?

- 3 The passage says the rescue technique “sounds like vandalism”. Why does it only sound that way?

- 4 The pit was saved by “a long, stubborn argument”. What does the word stubborn add that a word like lengthy would not?

- 5 What attitude does the writer take towards the Messel Pit, and how is it created?

- 6 Weigh up what is gained and what is lost when a Messel fossil is transferred into epoxy resin.

PART C Mark your own work

Now go back to the passage. Tick every answer you got right. You do not need the same words as the answer below — if you wrote the same idea in your own words, it counts.

- ☐ 1 • Mining stopped in 1971. Hesse bought the site in 1991.
- ☐ 2 • Because a crater blown out by steam is deep and steep-sided, the water at the bottom was still and had no oxygen in it. Nothing lived down there to eat or scatter a body, and nothing stirred the mud, so remains were buried whole and undamaged in very fine sediment.
- ☐ 3 • Because the preparator deliberately destroys the original rock, which seems like damaging an ancient object. In fact the rock is the thing that would destroy the fossil as it dried, so throwing it away is the only way to keep the specimen in one piece.
- ☐ 4 • Stubborn means refusing to give way. It tells you the collectors and scientists kept pressing their case for years against opposition rather than simply taking a long time, and that the pit was saved by persistence rather than by anyone changing their mind quickly.
- ☐ 5 • The writer treats it as something precious that looks like nothing at all. The attitude is built by setting plain, unimpressive description — grey rubble, birch scrub, no monument — against extraordinary detail such as structural colour on a beetle's wing and a mare with a foal inside her. Calling a quarry a library at the start sets up the same contrast.
- ☐ 6 • What is gained is survival: the specimen stops crumbling, can be handled, displayed and studied for generations, and fine detail such as fur outlines is held in place. What is lost is the setting — the surrounding shale is picked away and discarded, so the layers that would tell you exactly where and how the animal lay are gone, and the object becomes partly a modern manufactured thing. On balance the trade is worth making, because an uncollected fossil at Messel does not stay intact; the choice is not between resin and rock but between resin and flakes.

FACTS RECALLED IN PART A

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QUESTIONS CORRECT

— / 6

DATE

THE STRATEGY Self-explanation

When you meet a new fact, stop and explain it out loud to yourself in your own words, as though the listener knew nothing about it. Say why the still, oxygen-free bottom of a crater lake produces better fossils than a river would. The moment your explanation stalls you have found the exact gap in your understanding, which is far more useful than a page you have read three times and still could not teach.

WHERE YOU ALREADY DO THIS

Think of something you only really understood once you had to explain it to someone else — a game's rules, a piece of homework, a route across town. What did you notice you were missing as you talked?

FOR THE PARENT OR TEACHER · This sheet trains delayed recall, not reading speed. Let your teenager read the passage once, then cover it completely before Part A — no glancing back and no prompting, because the effort of hauling a half-remembered fact out of memory is what fixes it there. At this level mark the thinking rather than the wording: the answers given for the inference, tone and analysis questions are one good response each, not the only one.