

Right: An opportunity to appreciate the width of the cave's opening.

Writer, **Avraham Bresler** is a veteran diver, experienced in Dead Sea diving. For the past 20 years, he has been diving there as part of his job. He also provides workshops and courses to experienced divers interested in diving in the Dead Sea. Co-writer, **Dr Rachel Einav** is an ecologist specialising in marine environments.

During the course of his work, Bresler discovered the opening to an underwater cave that was unknown. Rachel – a confidant to the secret – understood the magnitude of the find, and together they organised an expedition to explore the cave and the salted sea above it.

The Dead Sea, the Salt Sea – as the Bible refers to it, is located between Israel and Jordan and is one of the oldest salt-water bodies in the world. It is mentioned in Genesis (14:3) as having five ancient cities along its shores, including Sodom and Gomorra along with their evil inhabitants who were destroyed by God's will. The Dead Sea is located at the lowest point of the Great Rift Valley, which extends from Syria to East Africa, and is the lowest point on earth (-424 below sea level); it is also the saltiest place on the planet.

It has been named the Dead Sea because there is nearly no life form in its waters – neither fish nor snails. The only organisms capable of subsisting within are blue-green algae (Cyanobacteria) that are resistant to high salinity levels. In addition to cooking salt, the Dead Sea also contain chorine, bromine, potash and magnesium, which endow its waters with their medicinal qualities, attracting tourists to its shores. Over recent years, there has been a drastic decline in the sea's level, due to overuse of the Jordan River that feeds it, by neighbouring countries; and this ancient sea faces a concrete threat of total annihilation.

Divers who immerse themselves in its depths are few – diving here is possible but difficult, complex and more dangerous than diving elsewhere. The water's salinity is 10 times that of the ocean, and thus visibility is close to zero. As a result, underwater photography is also much more difficult. Strong lighting is required and, even then, only several out of hundreds of photographs are worthy of publication to depict the beauty of this cave.

Another problem facing divers is the specific gravity of the heavy water. Even in a regular ocean, divers require weights to



TEXT AVRAHAM BRESLER & DR RACHEL EINAV

## DIVING THE DEAD SEA

Bresler's cave: At the lowest point on Earth

Tom Peled



dive. In the Dead Sea, an average diver requires – aside from diving gear and tanks – about 50 kilogramme of lead weights, a heavy, clumsy and frightening prospect...

The third obstacle is the salt. During a regular dive, the intrusion of a small amount of water is no great incursion; indeed one often allows some water to seep in, in order to clean the mask. The penetration of even a small amount of Dead Sea water into a diver's mask or eyes, however, is not an option. Thus, one must dive with a full-face mask that covers the entire face, the eyes, the nose and the mouth. The regulator is part of the mask; and the pipe that leads the compressed air in from the tank is connected to it directly.

Rachel Elnav



Assaf Tzabar

**Top:** Avraham and David carrying the equipment to the boat. The task requires two strong men. Notice the amount of lead weights.

**Above:** Avraham and David in full-face masks, protecting the eyes from the salt water.

**Right:** David at the mouth of the cave – a torch in his right hand and the pulley in his left.



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One should also mention, at this point, that marine gauges are inaccurate in the Dead Sea, as are depth gauges and dive computers that may, in fact, correctly measure pressure and time allowable underwater; but their depth readings are incorrect. The pressure of one metre of Dead Sea water is equal to the pressure of 1.3 metres of regular seawater; and so, when the gauge shows 13 metres, one is – in fact – at a depth of only 10 metres. This is merely a partial example of difficulties encountered in Dead Sea diving.

The discovered cave – the first of its kind – is located in one of the southern Dead Sea's northern pools. Upon the water's surface, trained eyes can distinguish a canyon, its deeper level sporting a darker shade of blue. Inside the canyon, the still deeper water of a hole comes as a surprise. Its even darker blue has been discerned from aerial photographs for at least 40 years, but never been explored. Bresler's team (Avraham and David) while on a work-related dive to the hole, were amazed to discover a crevice in the depth of the hole, at a depth of between 10 and 20 metres – an underwater cave. They peeped in but did not enter – experienced divers do not take such chances unprepared.

A month later, in May 2011, an expedition organised to enter the virgin cave met. Avraham and David were joined by Tom, an underwater photographer, and Rachel – in the role of photojournalist. Preparations were lengthier than usual for obvious reasons; and during the briefing, every possible eventuality of diving into the unknown was delved into. The maximum amount of time that divers can remain underwater at 20 metres is about 50 minutes, and each team member had a personal dive computer. The sophisticated masks also enable underwater communication; and the divers can talk freely, exchanging impressions and sending out direction and distress signals, if needed.

An additional important precaution was cable pulleys whose ropes were secured to the opening of the cave. Since the cave walls are of salt, connecting ropes inside the cave would be impossible, as the sides would crumble upon touch. It was thus necessary to tie the ropes to a heavy rock at the entrance to the cave. Using anchors is also difficult in the Dead Sea, as we know, and instead of an anchor, the waiting boats were also tied to a large rock thrown into the sea. Following the dive, the rock would remain and the ropes collected.

As a safety measure, it was decided that this first dive into the deep would extend no more than 15 metres into the cave. "If it's deeper," Avi established, "we'll return at a later date." Everyone was equipped with a torch, the directive being that if someone drops a torch, they all return to base.

During the boat's first circuit around the site, a seismograph was used to indicate the approximate location of the cave's opening, using floats. Afterwards, the boat returned to shore to load the divers and their equipment. Everything ready, since it is too hot to dive with rubber suits, the divers settled on red and blue woven overalls.

Avraham dived first, checking whether the floats had not moved. Tom followed with his camera, then David – after helping

**Did you know?**

The Dead Sea is a geographic feature formed by the Dead Sea Transform Fault, which lies along the tectonic plate boundary between the African and the Arabian Plates

Both plates are moving in a north-northeast direction, but the Arabian Plate is moving faster. This tectonic drift pulls a section of the earth's crust apart due to the angle of the fault line, giving rise to the phenomenon of extension. New crust is formed, resulting in the formation of a depression (also called a pull apart basin). The Dead Sea is one of such examples.



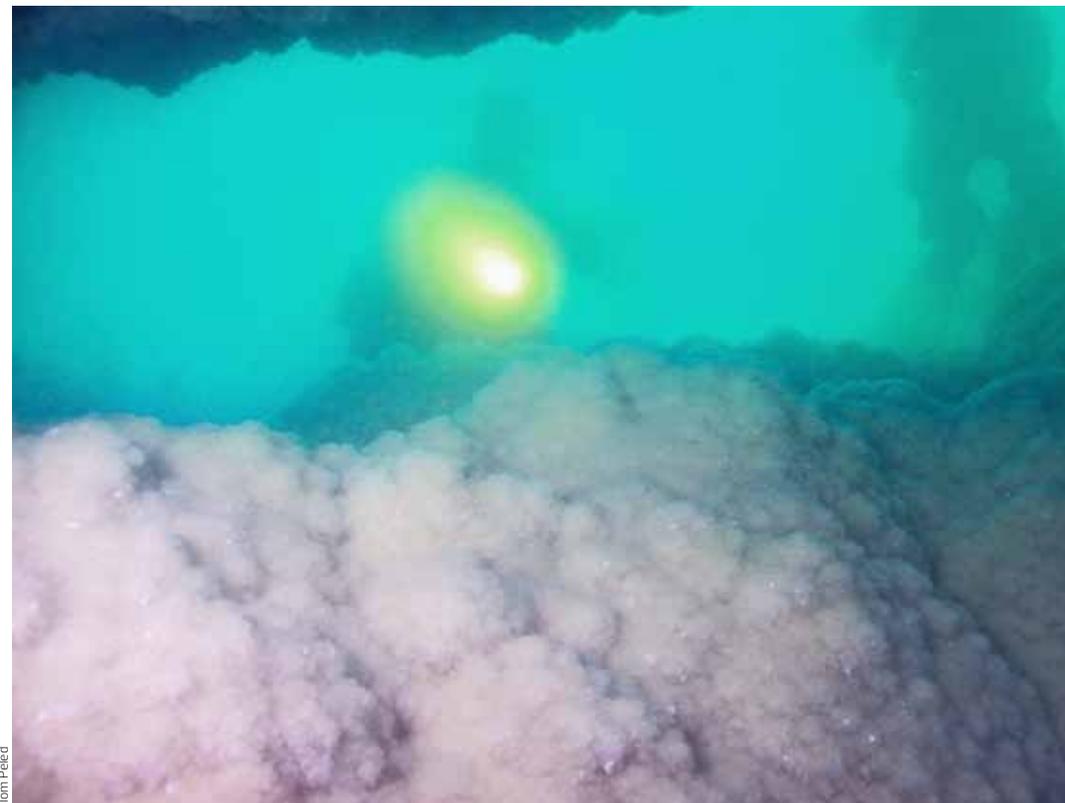
> All year round  
(January = 18° C, August = 28–35° C)



> Dead Sea Divers (Israel)  
deadseadivers.com



**Above:** The moment of truth: a view of the cave mouth; a narrow crevice leading to a hall. Eight metres of salt-crystal covered cave that, before this, was hidden from the world.  
**Bottom:** Taking photos in the Dead Sea is encumbered by the high salinity, which bemires water and breaks the light beam. Out of hundreds of attempts, only several are publishable.



Tom Peled

everyone else get organised. Rachel remained on the boat to monitor the bubbles rising from the salted water...

First came three bursts, then a steady stream of smaller bubbles – a sign for her that the divers had entered the cave. The regularity of the bubbles was an indicator that the situation was satisfactory. Forty minutes of waiting later, the bubbles once again separated into three independent streams – witness to their emerging from the cave.

Avraham, David and Tom broke surface excited, as though this was their first dive ever. What a place! What a dive! Cries of excitement and less repeatable exclamations of wind-worn sailors were heard as they raised their equipment to the boat. Only after they had climbed aboard themselves was it possible to glean from them any descriptions of the cave.

The entrance is dome-shaped (perhaps remnants of an additional hall that collapsed). From there, a narrow entrance to the cave is barely traversable. After entering, they swam in single line formation through a narrow passage, passing through angles that prevent light from entering but not the water. The rest of the excursion was in the dark, by torchlight. "Losing your torch in that cave could be unpleasant. You wouldn't find your way back."

But our divers managed to hold on to their torches and the two rope pulleys, daring to continue inwards and, later, back out... After swimming through some narrow salt-lined passages, the cave widened, creating a sort of hall, through which all three divers could swim abreast.

The cave reminds one of fairy tales and crystals: it begins in a greenish light – the result of the narrow spectrum that manages to penetrate the salt water and the opening of the cave. Afterwards, the only light is that of the torches. The walls are white, somewhat transparent, crystallised in shades of sparkling salt that covers the cave in every direction. It is the ambiance of an "other" world tempered by genesis. It seems like our world, but not yet touched by mankind... its secret intact.



Rachel Einav



Rachel Einav

## DIVING THE DEAD SEA IS AN EXTREME EXPERIENCE THAT EVERY PROFESSIONAL DIVER WISHES TO DISCOVER.

The general impression was that the water inside the cave was sweeter than that of the Dead Sea. It was clearer – it was easier to take photographs than at the cave's mouth; the crystals that comprise the walls of the cave were very sharp, and it seemed as though the salt had been rinsed out of them; and there was no rounded fungus evident that is usually characteristic of slow salt crystallisation. The cave is eight metres in length, its inner edge sporting a closed shaft aimed at the surface. In several thousand years, it will perhaps open up and the cave will be better lit..

And just how was it created, this cave? The assumptions raised seem logical to geologists who were later consulted. To the best of our knowledge, the area above the cave was never dry, and it must therefore be quite ancient – having sufficient time to form. The declining depth of the water that threatens to dry the Dead Sea simply brought the cave closer to the atmosphere and the divers, thus engendering its own discovery.

Along the shore, reeds (*Phragmites* sp.) indicate where sweet ground water is accumulating. Perhaps as a result of a geological rift, a crack was formed in the rock, which the sweet water widened by dissolving the salt. As sweet water is lighter than salt water, it then rose, thus forming the shaft in the canal roof. Over time, the process may evolve, thus producing an upper opening to the cave, which will then collapse inward, forming a sinkhole. Perhaps the pit discernable in aerial photographs is the result of substrata dissolved by sweeter water that emerged from the cave and so exposed its opening. I wonder whether we should call this a spring or a well.

Diving the Dead Sea is an extreme experience that every professional diver wishes to discover. Due to the sea's unconventional character, diving there without the proper training is difficult and even prohibited. Still, even for those divers experienced in salt sea diving, this cave presents a unique experience – one more site to see before you shuffle off. **AD**

### Halobacteriaceae

- Ancient, red-coloured microorganism
- Predates bacteria by several decades
- Known as extremophiles, which is an organism that thrives in physically or geochemically extreme conditions that are detrimental to most life on Earth
- Known to survive for thousands of years in dried-out salt beds
- Simple and rugged biology a possible direction for future scientific research that could lead to treatments for cancer, neurodegenerative diseases etc.

### Dunaliella

- Salt-loving green alga
- The food of the halobacteriaceae
- Survives because it controls its inner liquids with a super-high amount of glycerol

**Above:** After the excitement of the dive, Tom makes his way towards the shower installed on top of the car. Because of the saltiness – 10 times that of regular seawater – showering is an immediate necessity.



**AVRAHAM BRESLER SEA WORKS LTD** is a professional dive company specialising in sea diving and services – including the Dead Sea. Dead Sea diving endorsement training is provided here. [deaddseadivers.com](http://deaddseadivers.com)

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