

Can you fit inside?

Take a look at some of the world's smallest places

By LEONARDO VINTINI
Epoch Times Staff

We live in a world of diverse places—some are big, and others small. Of course, inside some of the smallest places in the world, a lot can still be found even if it is a little cramped. Can you fit inside?

The theatre of small convenience

Located in Edith Walk in the center of Great Malvern, England, you'll find a tiny, ornate space adorned with a dozen armchairs—and a stage.

Originally constructed as a Victorian bathroom for gentlemen, the space was modified into a theater in 1999 by Dennis Neale who still runs this independent, nonprofit. In 2002, the Guinness Book of World Records acknowledged it as the world's smallest theater.

The Theatre of Small Convenience has become a featured attraction at the Malvern Fringe Festival, an annual three-day arts festival held every June since 1977. The 33-square-foot space is lavishly decorated with whimsical landscape murals. In the off season, this small stage serves up primarily puppet

shows, but it also offers the occasional opera.

Tiny living

When discussing the world's smallest house, many refer to a 6-foot-wide, 8-foot-deep, and 10-foot-high dwelling in North Wales. This 19th century fisherman's cottage is now open to the public—if they can fit inside. The little house was acquired by 6-foot Robert Jones at the beginning of the 20th century, who traveled all over England to make sure that his was the smallest in the country. Although it was typical for the time of its construction, the minuscule home lacks an important modern feature—a toilet.

Another contender is Thimble Hall, located in Derbyshire, England. Although its external dimensions (11.9 x 10.3 x 12.13 feet) significantly surpass those of the fisherman's cottage above, this house once housed a family of eight in the 19th century.

But don't think that tiny homes are just a thing of the past. Carrying on the small-living tradition, entrepreneur Jay Shafer started the Tumbleweed Tiny House company in 1997. Appealing to homebuyers looking to lessen their impact on the

environment, Shafer offers dwellings with all the modern amenities—including bathrooms—starting at just 65 square feet.

Dance, but don't push!

Again in England, London's "Miniscule of Sound" carries the title of the smallest dance club on Earth. Operating since 1998, the night club has a capacity of no more than 14 people, including the disk jockey.

In 2005, the Miniscule of Sound carried its "keep it tiny" style to the Far East. The small night club model is now in Beijing, where seven or eight people can dance very carefully to the music.

Mill ends, the smallest park

In the beginning, Mill Ends was just a section of empty traffic median in the middle of Portland, Oregon, intended to be a base for a light pole, but the lamp never arrived. Soon this small patch of forgotten space became overgrown with weeds. That's when Dick Fagan, a journalist for the Oregon Daily, decided to plant flowers in the nearly 2-foot cement oval. He named the space "Mill Ends" after his weekly column, and the smallest park in the world was born.

However, Fagan offers more mystical details to his version of the story. According to the first article in which the columnist mentioned the tiny park, he writes that while he was observing this space from his office window on St. Patrick's Day in 1948, he witnessed a leprechaun digging a hole. Fagan tells how he ran down to the street and captured the mythical creature, named Patrick O'Toole, who granted him a wish in exchange for his freedom. Fagan requested that the tiny plot become a park.

Fagan's magical median was officially named a city park in 1976, and it continues to exhibit the same whimsical nature as its creator. Among various installations, Mill Ends has been granted a swimming pool for butterflies and a tiny Ferris wheel.

The smallest island

Located in the Atlantic Ocean, at the far west end of the U.K.'s Isles of Scilly, Bishop's Rock is outfitted with a lighthouse that occupies 90 percent of its landmass. It is recognized as the smallest developed island in the world.

The initial attempt to build a lighthouse on the tiny island got washed away in 1850. Different design considerations had to be made to accommodate the tiny landmass, and by 1858 the lighthouse was in operation. Difficulties getting to the island by boat prompted the addition of a helipad for the top of the lighthouse in 1976, and it is still in operation today.



TINY LIVING: Appealing to homebuyers looking to lessen their impact on the environment, the Tumbleweed Tiny House company offers homes starting at just 65 square feet. WWW.TUMBLEWEEDHOUSES.COM



ADDING UP: Contradicting past studies, researchers now find that if girls are given the same opportunities and encouragement, they do just as well at math as boys. PHOTOS.COM

Research shows girls can be just as good at math

WASHINGTON (Reuters)—Girls can do just as well at math as boys—even at the genius level—if they are given the same opportunities and encouragement, researchers reported.

Their study, published in the Proceedings of the National Academy of Sciences, contradicts studies showing girls can do as well as boys on average in math—but cannot excel in the way males can.

They also said it is a clear rebuttal to Larry Summers, who as president of Harvard University said in 2005 that biological differences could explain why fewer women became professors of mathematics. Summers is now chairman of the Council of Economic Advisers for President Barack Obama.

"We conclude that gender inequality, not lack of innate ability or 'intrinsic aptitude,' is the primary reason fewer females than males are identified as excelling in mathematics performance in most countries, including the United States," Janet Hyde and Janet Mertz of the University of Wisconsin in Madison wrote in their report.

They did a statistical analysis comparing various math scores and contests with the World Economic Forum's 2007 Gender Gap

Index. This annual report ranks countries according to employment and economic opportunities, education and political opportunities, and medical status.

The United States ranks 31 out of 128 nations on the World Economic Forum index.

"We asked questions about how well females relative to males are doing at the average level, at the high-end level—95th percentile or above—and the profoundly gifted level, the one-in-a-million type level," Mertz said in a telephone interview.

"Countries with greater gender equity are also the ones where the ratio of girls to boys doing well in math is close to equal," she said.

Gifted and Average

She said no one disputes that at the average level, girls perform as well as boys mathematically.

But at the top levels, disparities persist and some experts have said this is due to the "greater male variability" theory—the idea that males in general are more likely to score both extremely high and extremely poorly on tests than girls are.

Mertz said the analysis shows this is not true. "It's not that everywhere in the world there are fewer

girls than boys in the top 1 percent," she said.

If there were a biological reason for the differences, this would have to hold everywhere, she said. But it does not.

"Analysis of data from 15-year-old students participating in the 2003 Program for International Student Assessment likewise indicated that as many, if not more girls than boys scored above the 99th percentile in Iceland, Thailand, and the United Kingdom," Mertz and Hyde wrote.

Several different international tests show the same pattern, including the International Math Olympics, Mertz said.

"If girls don't have equal educational opportunities or if they know [that] if they learn the material there won't be jobs available to them, why bother, they seek something else," she said.

This is changing, slowly, in the United States, they pointed out.

"For example, only 14 percent of the U.S. doctoral degrees in the biological sciences went to women in 1970, whereas this figure had risen to 49 percent by 2006," they wrote.

"The percentages in mathematics and statistics were 8 percent in 1970 and 32 percent in 2006."

Deepest part of the oceans no longer hidden

Nereus is first undersea vehicle to enable routine scientific investigation of ocean depths worldwide

National Science Foundation

The Abyss is a dark, deep place, but it's no longer hidden. At least when Nereus is on the scene. Nereus is a new type of deep-sea robotic vehicle, called a hybrid remotely operated vehicle (HROV).

Nereus dove to 6.8 miles on May 31 in the Challenger Deep in the Mariana Trench in the western Pacific Ocean, reports a team of engineers and scientists aboard the research vessel Kilo Moana.

The dive makes Nereus the world's deepest-diving vehicle, and the first vehicle to explore the Mariana Trench since 1998.

"Much of the ocean's depths remain unexplored," said Julie Morris, director of the National Science Foundation (NSF)'s Division of Ocean Sciences, which funded the project. "Ocean scientists now have a unique tool to gather images, data, and samples from everywhere in the oceans, rather than those parts shallower than 4 miles. With its innovative technology, Nereus allows us to study and understand previously inaccessible ocean regions."

Nereus's unique hybrid-vehicle design makes it ideally suited to explore the ocean's last frontiers, marine scientists say. The unmanned vehicle is remotely operated by pilots aboard a surface ship via a lightweight, micro-thin, fiber-optic tether that allows Nereus to dive deep and be highly maneuverable. Nereus, however, can also

be switched into a free-swimming, autonomous vehicle mode.

"Reaching such extreme depths is the pinnacle of technical challenges," said Andy Bowen, project manager and principal developer of Nereus at the Woods Hole Oceanographic Institution (WHOI). "The team is pleased that Nereus has been successful in reaching the very bottom of the ocean to return imagery and samples from such a hostile world. With a robot like Nereus we can now explore anywhere in the ocean. The trenches are virtually unexplored, and Nereus will enable new discoveries there. Nereus marks the start of a new era in ocean exploration."

Nereus (rhymes with "serious") is a mythical Greek god with a fish-tail and a man's torso. The vehicle was named in a nationwide contest open to high school and college students.

Destination: Mariana trench

The Mariana Trench forms the boundary between two tectonic plates, where the Pacific Plate is subducted beneath the small Mariana Plate. It is part of the Pacific Ring of Fire, a 25,000-mile area where most of the world's volcanic eruptions and earthquakes occur. At over 3,600 feet, its depth is about the height a commercial airliner flies.

To reach the trench, Nereus dove nearly twice as deep as research submarines are capable of, and had to withstand pres-

ures 1,000 times that at Earth's surface—crushing forces similar to those on the surface of Venus, according to Dana Yoerger of WHOI and Louis Whitcomb of Johns Hopkins University, who developed the vehicle's navigation and control system and conducted successively deeper dives to test Nereus.

"We couldn't be prouder of the stunning accomplishments of this dedicated and talented team," said Susan Avery, president and director of WHOI. "With this engineering trial successfully behind us, we're eager for Nereus to become widely used to explore the most inaccessible reaches of the ocean. With no part of the deep seafloor beyond our reach, it's exciting to think of the discoveries that await."

Only two other vehicles have succeeded in reaching the Mariana Trench: the U.S. Navy-built bathyscaphe Trieste, which carried Jacques Piccard and Don Walsh there in 1960, and the Japanese-built robot Kaiko, which made three unmanned expeditions to the trench between 1995 and 1998.

Trieste was retired in 1966, and Kaiko was lost at sea in 2003.

Unique technologies

The Nereus engineering team believed that a tethered robot using traditional technologies would be prohibitively expensive to build and operate. So they used unique technologies and innovative meth-

ods to strike a balance between size, weight, materials cost, and functionality.

Building on previous experience developing tethered robots and autonomous underwater vehicles (AUVs), the team fused the two approaches together to develop a hybrid vehicle that could fly like an aircraft to survey and map broad areas, and then be converted quickly into a remotely operated vehicle (ROV) that can hover like a helicopter near the seafloor to conduct experiments or to collect biological or rock samples.

The tethering system presented one of the greatest challenges in developing a cost-effective ROV capable of reaching these depths. Traditional robotic systems use a steel-reinforced cable made of copper to power the vehicle, and optical fibers to enable information to be passed between the ship and the vehicle. If such a cable were used to reach the Mariana Trench, it would snap under its own weight before it reached that depth.

To solve this challenge, the Nereus team adapted fiber-optic technology developed by the Navy's Space and Naval Warfare Systems Center Pacific to carry real-time video and other data between the Nereus and the surface crew. Similar in diameter to a human hair and with a breaking strength of only 8 pounds, the tether is composed of glass fiber with a very thin protective jacket of plastic.

Nereus brings approximately 5 miles of cable in two canisters the size of large coffee cans that spool out the fiber as needed. By using this very slender tether instead of a large cable, the team was able to decrease the size, weight, complexity, and cost of the vehicle.

Another weight-saving advance of the vehicle is its use of ceramic spheres for flotation, rather than the much heavier traditional syntactic foam used on vehicles like the submersible Alvin or the ROV Jason.

Each of Nereus's two hulls contains between 700 and 800 of the 3.5-inch hollow spheres that are precisely designed and fabricated to withstand crushing pressures.

WHOI engineers also developed a hydraulically operated, lightweight robotic manipulator arm that could operate under intense pressure.

With its tandem hull design, Nereus weighs nearly 3 tons in air and is about 14 feet long and approximately nearly 8 feet wide. It is powered by more than 4,000 lithium-ion batteries. They are similar to those used in laptop computers and cell phones, but have been carefully tested to be used safely and reliably under the intense pressure of the depths.

"These and future discoveries by Nereus will be the result of its versatility and agility—it's like no other deep submergence vehicle," said Tim Shank, a biologist at WHOI who is aboard the expe-

dition. "It allows vast areas to be explored with great effectiveness. Our true achievement is not just getting to the deepest point in the oceans, but unleashing a capability that now enables deep exploration, unencumbered by a heavy tether and surface ship, to investigate some of the richest geological and biological systems on Earth."

Deepest dive

On May 31, the team took the vehicle nearly 3,000 feet, the deepest dive to date.

On its dive to the Challenger Deep, Nereus spent more than 10 hours on the bottom, sending live video back to the ship through its fiber-optic tether and collecting biological and geological samples with its manipulator arm, and placed a marker on the seafloor signed by those onboard the surface ship.

"The samples collected by the vehicle include sediment from the tectonic plates that meet at the trench and, for the first time, rocks from deep exposures of the Earth's crust close to mantle depths south of the Challenger Deep," said geologist Patty Fryer of the University of Hawaii, also aboard the expedition. We will know the full story once shore-based analyses are completed back in the laboratory this summer. We can integrate them with the new mapping data to tell a story of plate collision in greater detail than ever before accomplished in the world's oceans."