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▼ People cooling off in Lake Geneva in the summer, a scene that would have been unthinkable in the 1960s

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From scum and sewage to 'blue gold' How Switzerland cleaned up its water

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In the first days of spring, people flock to Lake Geneva's tree-lined promenade, their faces tilted towards the sun. Dior, Cartier and Rolex are among the high-end shopfronts overlooking the water.

René Rottenberg, 75, has just finished his 400m swim - a ritual he repeats up to five times a week, even in midwinter. For the retired gynaecologist, being able to swim in the crystal-clear water is the greatest luxury. "It's just so fun," he says. "The place is beautiful."

Rottenberg is a member of Les Givrés swimming club in the centre of the city. Dentists, secretaries, judges, teachers and retirees all brave the 8C (46F) water in their lunch break, emerging red and blotchy with cold. "You find everyone here," says Rottenberg. They have lunch together before being swallowed back into the city.

The sight of people launching themselves into an inner-city waterway would be unthinkable in most cities in Europe, the US and many other parts of the world.

Three-quarters of Britain's rivers are in poor ecological health, according to data collected by thousands of citizen scientists

in 2024, with experts describing the findings as "truly disturbing". Pollution from water companies and agricultural runoff are driving the contamination, which affects all parts of the country, causing toxic algal blooms, mass die-offs of fish, and risks to human health.

Yet across Switzerland, such swimming scenes are normal. This hasn't always been the case. In the 1960s, Switzerland had among the dirtiest water in Europe, blighted by mats of algae, mountains of foam, scum, and dead fish at the surface. For decades, swimming was banned in some rivers such as the Aare and Limmat on health grounds, and people could get ill if they swallowed the water.

Raw sewage and industrial wastewater flowed directly into water bodies - in 1965 only 14% of the population was connected to a wastewater treatment plant. Today, it is 98%, and the country has a reputation for pristine swimming waters, sometimes referred to as its "blue gold" - and it's all thanks to a complex network of sewage plants.

A key driver of that transformation was a tragedy in the mountain resort of Zermatt in 1963, when a typhoid outbreak killed three people and made 437 others ill. Soldiers were deployed and schools turned into emergency hospitals as panic spread. Pressure

grew on the government to clean up the waterways, found to be the source of the outbreak. In 1971, the treatment of wastewater was written into Swiss law.

Now Switzerland has some of the cleanest rivers in Europe. According to 2023 data from the European Environment Agency, just five of the country's 196 bathing areas were rated as poor quality. Politicians across the spectrum agree on the need to prioritise clean water.

"Very high water quality is important to the population," says Michael Mattle, head of wastewater technology at the engineering company Holinger. "We take a lot of care not to pollute water on its way through Switzerland."

And they pay for it: the government spent an average of £174 a person on wastewater treatment in 2022, compared with about £90 a person in England and Wales in the 2022-23 financial year, according to analysis by Ends Report.

Now, Switzerland is leading the world in purifying its water of micropollutants: a concoction of chemicals often found in bodies of water that look crystal clear. They include antidepressants, antibiotics, diabetes treatments and anti-inflammatories, which have unknown and potentially

damaging consequences for human and ecosystem health.

In 2016, Switzerland became the first country to enforce legislation to clean up drugs and chemicals that collect in waterways. This work is based on a precautionary principle - if something has unknown effects, err on the side of caution. "It's just a matter of time

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Wastewater tech head, Holinger



before they cause problems," says Mattle.

Conventional sewage treatment works are designed to deal with organic waste but are less effective with chemicals, hence plants across Switzerland are getting an upgrade.

A 20-minute bus ride from the lake is the Villette wastewater treatment plant, Geneva's first to treat micropollutants. It filters through 250 litres of water every second. First it filters out rubbish, food, money - anything people might flush down their toilets (a study found \$1.8m (£1.4m) worth of gold flows through Swiss sewers every year). Then fat and sand are removed before the water is treated in huge basins of bacteria that removes organic matter.

"It works like your stomach," says Frédéric Galley of Services Industriels de Genève (SIG), which manages the plant. Then the water is passed through activated charcoal, which acts like a sponge, absorbing the microchemicals.

Each year, the Swiss are adding micropollutant treatment facilities to seven sewage plants, and now have a total of 37. By 2040, there will be about 140, according to unpublished data from the Swiss Water Association (VSA). "Many people don't know the multitude of operations we have here, and how we do it," says Galley. "All our actions that we carry out, we do for the sake of the community."

Before 2016, a series of pilots found removing 80% of pollutants was the maximum amount achievable for a reasonable cost. Within the 20% of chemicals not removed are PFAs, also known as forever chemicals. Mattle says: "The endgame is to get these substances prohibited."

Wastewater experts from France, Italy and Belgium, among others, have visited the plant to see what lessons in micropollutant treatment they could take home.

In response to Switzerland's work, the EU requires wastewater treatment plants serving more than 10,000 people to be able to remove micropollutants by 2045. "They want to go very fast," says Mattle.

There are no plans in the UK to do the same, despite high levels of antibiotics and other drugs being found in waters on some of the most protected national landscapes.

People are not aware of how much work was necessary to purify Switzerland's water, but they consider it important, says Mattle. "I think Swiss people are proud of their water," he says.

On Lake Geneva, it is not just swimmers benefiting from the inviting waters: people read, share beers with friends, children jump between rocks.

"We are united by a love of water," says Pascal Baudin, another member of Le Givrés swimming club. The retiree comes every day, and says the swimming group has become an even more important social connection after he stopped working. "If you don't have friends, if you don't have a social life, you lock yourself in your house and you get depressed. Here is the ideal medicine - cold water and friends," he says.