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Ten reasons to be cheerful, part 2: Water [1]

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Some people tell us that water scarcity might well be the cause of future wars as the world struggles to cope with shortages. In fact water is my second cause for optimism.

2. Water

The shortage pointed to is of usable water, not of water itself. Although four-fifths of the Earth's surface is covered by water, some 97 percent of the Earth's water is too salty for people to drink or to use for irrigation, and much of the water that is accessible is not safe to drink. The question is whether we can develop the technology required to purify water to render it of drinkable quality at a price that can be afforded.

Great advances are being made in fairly low technology solutions to water purification in less developed countries. A range of ingenious solutions has been developed from simple filtration systems that use coal ash, to solar-powered ones using plastic bottles. Great efforts are under way from a number of foundations to finance the construction of deep wells to bring clean water to villages whose nearest other source is miles away.

A combination of such developments will contribute much to ensuring adequate supplies, but ultimately it could well be desalination technology that provides an inexhaustible supply. The main desalination technique hitherto has depended on boiling seawater and condensing the steam. This works well and is in widespread use, but it is very energy-intensive.

The alternative approach that is rapidly gaining ground uses osmosis (technically reverse osmosis) to separate out the salts using membranes. This also uses quite large amounts of energy, but advances in engineering are making it more efficient as time passes. Such plants could be solar powered as those costs come down, and can be located in areas that both need water and have many hours of sunlight.

Ultimately the question of the future supply of clean water comes down to whether we can develop the technology to purify water efficiently, and the answer seems to be that we can. Of course the water will have to be where it is needed, but its transmission is again a problem susceptible to technological solutions. Both of these depend on access to cheap and abundant sources of energy if they are to be affordable, and it seems likely that the gas revolution has made the breakthrough which makes that outcome likely.

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