

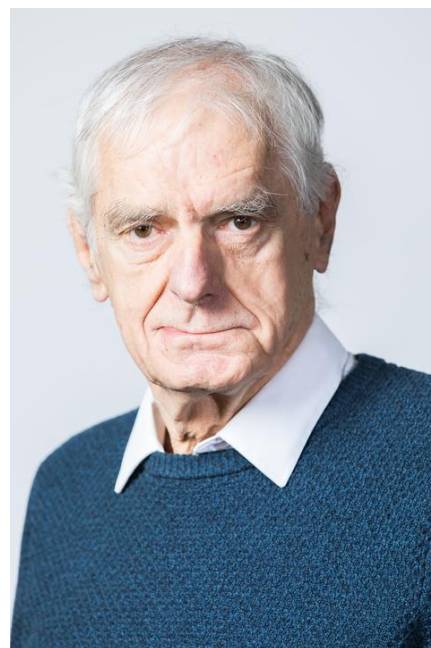
PROFESSOR STEPHEN HUGH SALTER MBE (R50-56)

Inventor of rare versatility, whose projects ranged from a wave power device to the first AI robot

The following obituary appeared in the [Guardian](#) on Saturday 9 March 2024 :

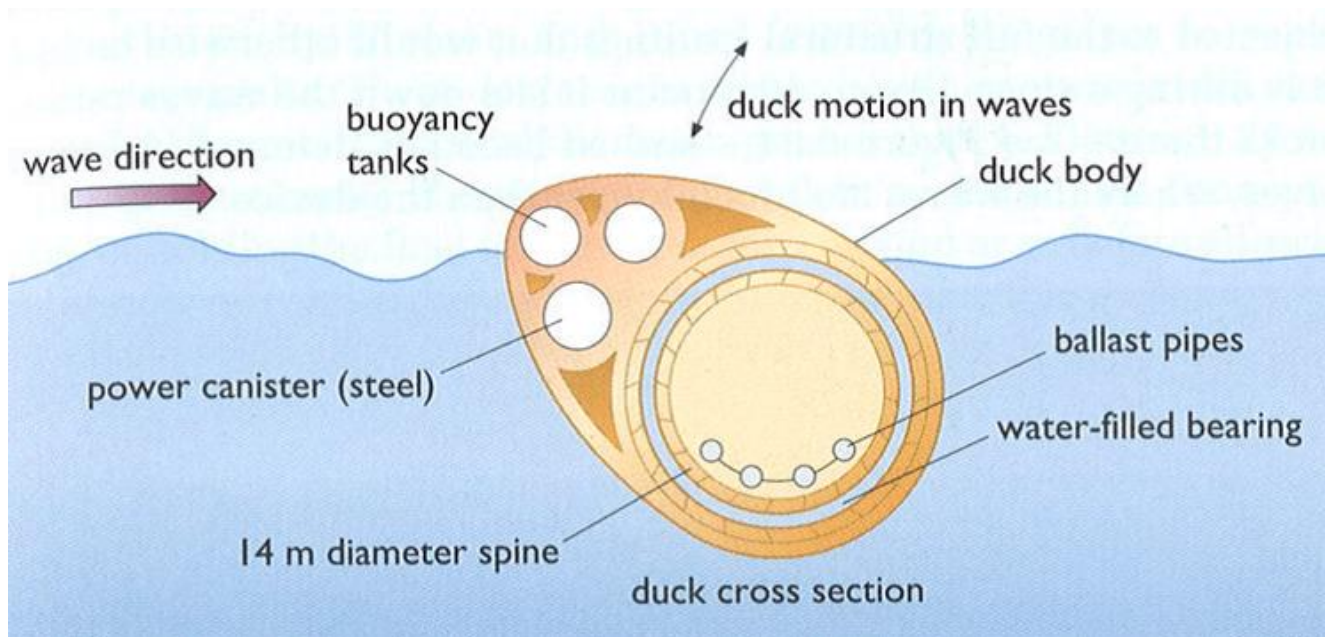
Stephen Salter, who has died aged 85, was the inventor of the Salter's Duck, a wave-power device that was the first of its kind and promised to provide a new source of renewable energy for the world – until it was effectively killed off by the nuclear industry.

In 1982, after eight years of development under Salter's direction at Edinburgh University, the United Kingdom Atomic Energy Authority (UKAEA) was asked by the government to see if the duck might be a cost-effective way of making large quantities of electricity. To the great surprise of Salter, and others, the UKAEA came to the conclusion that it was uneconomic, and that no further government funding should be given to the project.



A decade later it emerged that thanks to a misplaced decimal point, the review had made Salter's duck look 10 times more expensive than the experiments showed it was likely to be. The UKAEA claimed this was just a mistake, but Salter, who had never been allowed to see the results of the secret evaluation, put it another way: asking the nuclear industry to evaluate an alternative source of energy was like putting King Herod in charge of a children's home, he suggested.

The development of Stephen Salter's Duck, to produce energy from waves



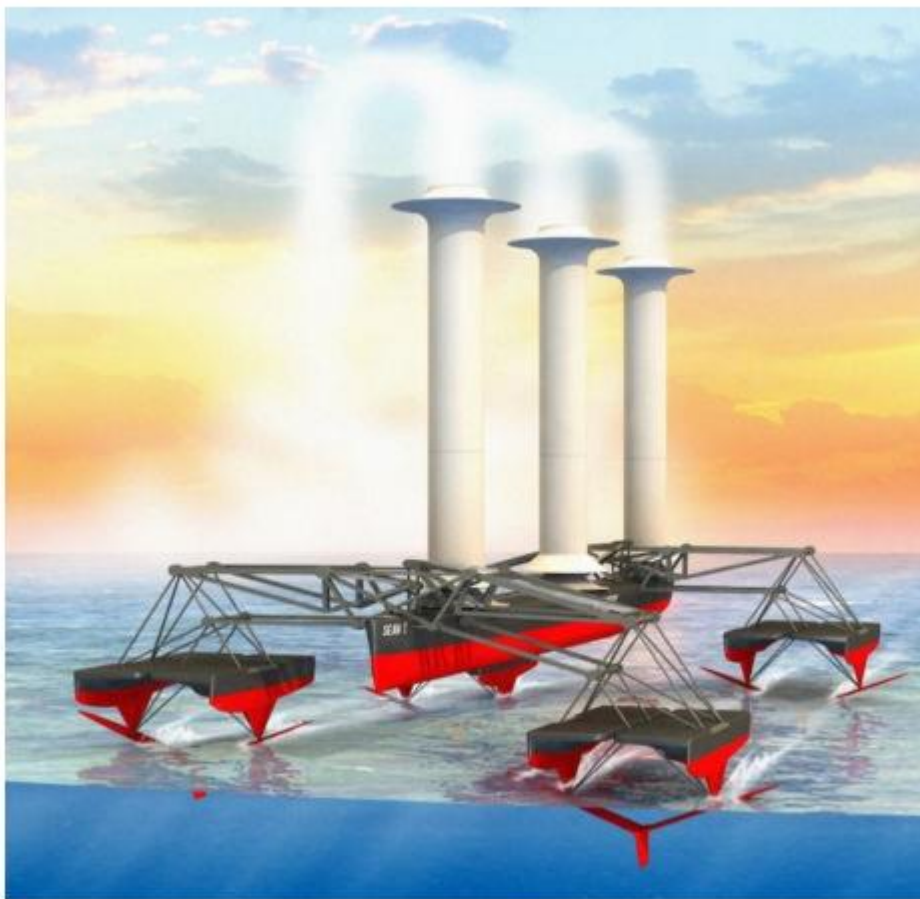
By then, however, Salter had become interested in other projects, and as a result his duck has never been tested at sea – although wave-power devices using some of his technology are now in development in the Orkneys and off the coast of Portugal.

The prototype ducks, developed in a multidirectional wave tank of Salter's invention, are now in the National Museum of Scotland in Edinburgh, where there are a number of other exhibits with links to him, including the only remaining Black Knight rocket, a UK ballistic missile from the 1950s, and Freddy the Robot, from the 60s, the first machine to have artificial intelligence that could "see" and had a sense of touch. He also invented the Dervish, a low-cost method of clearing landmines, by using a revolving three-wheeled vehicle with a constantly changing path.

Perhaps the range of those projects sums up Salter's mind better than anything else. Colleagues who worked with him said that while other scientists concentrated for years on one subject to the exclusion of all others, Salter was fascinated by new problems.

The development of Stephen Salter's Dervish, for clearing landmines

Although it was the oil shock of 1973 that first stimulated his interest in renewable energy, he later became one of the first scientists to realise the dangers of climate change. Doubting that the slow pace of cutting fossil-fuel use would be enough to save the planet from dangerous overheating, at the turn of the 21st century he set up a scheme to develop marine cloud brightening – an idea to produce more and brighter clouds in the middle of the oceans in order to reflect sunlight back into space, thereby keeping the oceans cooler and reducing sea-level rise.



Artist's impression (© John MacNeill) of a spray vessel driven by Flettner rotors. Waterline length 45 metres. Displacement 90 tonnes. Power of 300 kW for spray generation and rotor drive will be generated by the flapping motion of four variable-pitch hydrofoils. Design and visualisation by Professor Stephen Salter.

He designed a project to build a large number of automated ships spraying aerosols from sea water into the atmosphere to create and brighten clouds in the middle of the world's oceans and – having made a considerable fortune by selling some of his inventions – was able to set up the Lothian School of Technology just outside Edinburgh for £2.4m. The centre provides premises for up to 60 of his students to work on inventions and develop them commercially beyond their time at university.

[Click here](#) to hear him talk about marine cloud brightening

Born in Johannesburg, South Africa, Stephen was the son of British parents who had emigrated there, Rachel (nee Floyd) and Willoughby de Carle Salter. His father joined the Royal Navy as a meteorologist during the second world war and afterwards the family moved to Britain, where Willoughby became head of a prep school in which Rachel also taught. Stephen attended two boarding schools and then Framlingham College in Suffolk.

By that time he was designing, building and flying model aeroplanes, and his ambition was to take an engineering degree at Cambridge University. But he failed to get good enough grades, instead becoming an apprentice at Saunders-Roe, an Isle of Wight aero- and marine-engineering company, where he was involved in the Black Knight rocket project. After studying at night classes he was finally accepted at Cambridge to study natural sciences including metallurgy.

He moved to Edinburgh University in 1967, aged 29, to become a research fellow working on artificial intelligence in robots. Within six years he was also a lecturer and had begun his work on wave energy. In 1984 he became professor of engineering design.

Perhaps Salter's left-leaning politics and his willingness to take on the London establishment prevented him from being showered with the honours he deserved, but he was elected to a fellowship of the Royal Society of Edinburgh in 1991, made MBE in 2004, and inducted into the Scottish [Engineering](#) Hall of Fame in 2021. He never stopped working, becoming an emeritus professor at retirement age and continuing to research, advise companies and refine his inventions until the end.

He married Margaret Donaldson, a professor of development psychology at Edinburgh University, in 1973. She died in 2020. He is survived by his younger brother, Edmund.

Stephen Hugh Salter, inventor, born 7 December 1938; died 23 February 2024