



## Tracing a eureka moment

Peter Donaldson, Technology Editor

The origins of ideas are notoriously tricky to pin down, and one has to be very careful when making definitive statements about where things came from. I fell into this trap when I said in the November issue that the pioneers in underwater gliders were major academic institutions, without crediting the man who had the eureka moment – the realisation that adding wings to a variable buoyancy profiling float would produce a vehicle that could glide around the world at half a knot on half a watt with a payload of oceanographic sensors.

Contrary to popular belief, it was not the late Dr Henry (Hank) Stommel. Stommel, an oceanographer working at the Woods Hole Oceanographic Institution (WHOI), was an early, enthusiastic and effective supporter of the idea, who first popularised it in a science-fiction article entitled ‘The Slocum Mission’, published in April 1989 in *Oceanography* magazine.

Nowhere in the article does Dr Stommel claim to have invented the glider. Instead, he refers to ‘a pioneering ocean engineer’. The confusion may arise from the article’s status as a piece of science fiction, written as though by a scientist looking back at a 25-year career from 2021. That ‘pioneering ocean engineer’ was not fictional – he was Douglas C Webb, who went on to found the Webb Research Corporation and who, at 77, remains ‘a vigorous central figure in the company’, according to son Dan Webb. This is not a case of one man claiming credit for another’s idea – indeed, Webb and Stommel were friends, neighbours and colleagues for over 30 years – rather it is that the 1989 article has come to be seen as its origin.

According to Doug Webb, ‘I had the engineering foundation for an ocean glider and started a search for a science partner – initially, without success. I spoke frequently to Hank Stommel, a neighbour, who was, at first, only marginally interested, later became an enthusiastic supporter, sponsored the first funding contract with ONT [Office of Naval Technology], created descriptions of several science applications

and wrote the 1989 *Oceanography* article, a much-referenced paper.’

That the idea is at least 11 years older than the article is clear from a WHOI memo written in April 1978 by Stommel and colleague Lloyd Regier which says, ‘Doug Webb made some engineering computations of the power required to move steered SOFAR [sound fixing and ranging] floats at small speeds such as 10 km/day for periods of up to several months. The power requirements are so small that the idea is a practical one. What advantages might they have? Various ideas like shooting them across acoustic tomographic ranges, or at intervals northward from Bermuda to map the recirculation, come to mind.’

In 1982, Doug Webb left WHOI to form the Webb Research Corporation. By 8 February 1986, he had described in concept and produced preliminary designs for the thermal engine that the company’s Thermal Glider now uses to extract energy from temperature differences in water, energy that powers the vehicle’s buoyancy change pump. An entry in his notebook made two days later describes a 25 kg winged glider vehicle and predicts for it a 1,000 km range at 0.1 m/s, with a 30-degree glide angle.

Webb tested the prototype Slocum glider in Wakulla Springs, Florida, in January 1991, followed by tests of an autonomous glider with an autopilot involving 14 dives in Lake Seneca, New York, funded by WHOI and the Office of Naval Technology. In October 1996, the company shipped a prototype glider with spares, drawings and a video to Dr Russ Davis at the Scripps Institution of Oceanography. This vehicle, says Dan Webb, was the basis of the Spray design. October 2001 saw the first commercial sale of a glider, to Dr David Fratantoni, at WHOI. These deliveries represent a transfer of technology from industry to academia, but the man who conceived the idea years earlier was in academia at the time.

This is a common pattern for healthy technological progress. Long may it continue.

### Response

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