

**Dr EWH Gifford OBE***DSc FICE FStructE FRINA*

Dr Edwin "Giff" Gifford passed away at the age of 93 on 16th May 2014 after a long illness. He was an inspired and inspirational civil engineer, structural engineer and naval architect; a remarkable innovator, inventor and pioneer whose work has had international influence particularly in the fields of bridges, roads, hovercraft, fishing and marine archaeology.

Giff pioneered the use of prestressed concrete along with an innovative approach to construction to achieve very low-cost structures. He later became deeply involved in the commercial development of the hovercraft, in designing and building wooden fishing boats in India and other parts of the third world and, in his later years, the reconstruction of ancient ships.

Prestressed concrete was taken up in France before the Second World War but was little used in the UK until Giff and a small band of engineers sought cheaper but reliable construction methods to help in post-war reconstruction, when materials were in short supply and thrift was essential.

Giff recognised the advantages of using prestressed concrete whilst designing and organising the building of road and footbridges for Hampshire County Council. In 1951 he founded his own civil engineering design consultancy (EWH Gifford & Partners) and in collaboration with a Southampton building contractor, Udall, devised a new prestressing system, which became known internationally as the Gifford-Udall system. It used wire and strands of metal to strengthen concrete and was soon adopted around the world. Giff designed the superstructure for two major bridges in Australia – the Narrows Bridge

over the Swan River in Perth and the Tasman Bridge in Hobart, breaking new ground in scale and economy. These elegant, minimal structures reflected his belief that good engineering should consider aesthetics as well as function.

Edwin William Henry Gifford was born on 20th March 1921 in Walthamstow, East London. He was educated at King's College School in Wimbledon and as a schoolboy developed an early interest in boats and sailing. He hesitated between becoming a naval architect or a civil engineer. He chose the latter, but had an honorary naval architecture fellowship bestowed upon him later in his career. He studied at King's College, London (which was based in Bristol during the war) and on graduation joined the Royal Navy, which despatched him to John Brown's shipyard in Glasgow to train as an Engineering Officer. He was posted to the aircraft carrier HMS Furious, spending some time at Scapa Flow in the Orkneys and finally to the battleship King George V patrolling the Pacific and Indian Ocean. In 1948 Giff married Joyce Alexander, a geographer and fellow student at Kings and, when she was offered a lectureship at Southampton University, they moved to Hampshire.

Through his innovative thinking, structural expertise and enthusiasm for engineering challenges, Gifford & Partners (acquired by the Danish group Ramboll in 2011) expanded into a successful, award winning practice with an exceptionally broad portfolio including, in addition to bridges - roads, hospitals, schools, harbours and marine structures, building services and conservation, plus repair and preservation of ancient structures including strengthening the 13<sup>th</sup> century spire of Salisbury Cathedral. Giff's original ethos continues and recent successes include the Gateshead Millennium Bridge.

The practice's 1960s initial collaboration with Sir Christopher Cockerell, on the landing and terminal facilities for hovercraft around the world, led to Giff's own significant involvement in this revolutionary mode of transport. In 1965 he became a founder director of Hovertravel Ltd, the world's first passenger hovercraft service, which still provides the fastest link to the Isle of Wight. During the early years of Hovertravel, which had purchased hovercraft built by aircraft manufacturers employing expensive engines and manufacturing techniques, he began to realise that there must be a better design solution and to that end founded Griffon Hovercraft Ltd in 1976. With his son John, he successfully developed Griffon to become the world's leading manufacturer of small to medium sized hovercraft.

Also with Sir Christopher and others, he founded Wavepower Ltd, pioneering the development of marine renewable technologies. He assembled a large development team and test facilities to assist the Department of Energy in its first national wave energy programme, only for that to end in 1982 when fears over the security of oil supplies receded.

Following the practice's development work on UK fishing harbours and his experiences in Africa and Central America for the United Nations Food and Agriculture Organisation, Giff came to the conclusion that building harbours and introducing industrialised western fishing methods was proving counterproductive in many parts of the Third World. He became convinced that beach landing fishing craft should improve rather than replace indigenous methods of fishing, and set about designing and developing small sailing fishing vessels of various types and materials. He eventually settled on plywood craft with "stitch and glue" hull constructions. There are an estimated

10,000 plywood fishing boats, derived from this initiative, working in India today. Giff was awarded the OBE in 1981 for his work in this field.

His long-time commitment to Southampton University, which began with Joyce's lectureship and their shared involvement with the university rowing club and continued with his role as a member of Council, resulted in him being awarded an honorary doctorate.

Giff formally retired from Gifford and Partners in 1986 in order to turn his attention and energies towards the reconstruction and trialling of ancient boats. With his wife Joyce, he undertook several significant marine archaeological research projects including the half-scale reconstruction of *Ottar*, a 9<sup>th</sup> century Saxon longboat, the remains of which had been found in the Kent marshes at Graveney. Although considered to be a rowing boat, on trials in Southampton Water he demonstrated that it sailed well and could tack into the wind, strengthening his belief that Anglo-Saxon traders used home built ships of this sort for their trade rather than relying on ships built on the Continent.

In 1989 the Sutton Hoo Trust heard of his success with *Ottar*. They wanted to know whether the famous Anglo-Saxon longship found at Sutton Hoo, could have crossed the North Sea as the outline remains showed no evidence of a keel or mast. The Giffords again built a half-scale replica, which they named *Sae Wylfing (Sea Wolf Cub)* and with a loyal crew from the Colchester Re-enactment Society demonstrated that it could indeed sail very fast. Another reconstruction, this time of a much earlier, Bronze Age plank boat based on remains found at Ferriby on Humberside, featured on the BBC's *Coast* programme.

An altruistic, creative and positive man, Giff's achievements were founded on his passion for engineering and a commitment to making the world he loved a better place. A charismatic leader and initiator of many significant developments and enterprises, he never allowed profit to compromise his core principles.

Joyce died on 31 March 2014. Giff leaves behind two sons; John a mechanical engineer and Alex a musician, a daughter Jane an artist, and three grandchildren, Rachael, Katherine and Matthew.