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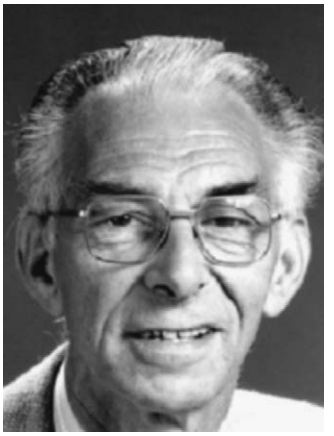
Dedication of Proceedings to Dr Jack Gerrard 31.12.1928–21.05.2005



This Special Proceedings issue of the *Journal of Fluids and Structures*, containing papers from the BBVIV4 Conference in 2005, is dedicated to the memory of Dr. John (Jack) Higson Gerrard. Jack is responsible for a number of groundbreaking ideas that transformed the study of bluff body wakes. These include his physical model of the near wake, the use of point vortices to model bluff body wake flows, his findings from the study of low Reynolds number wakes, the discovery of transition waves in the wake of a circular cylinder and his observations on the importance of three dimensionality in the wakes of two-dimensional bodies.

Jack Gerrard was born in Heaton Moor, South Manchester, and grew up in Irlams o' th' Height, Salford. He attended Salford Grammar School and became an undergraduate at Manchester University, initially to study Chemistry. However, he transferred to Physics at Manchester, graduating in 1950. In the same year Jack joined the then Fluid Motion Laboratory (later to become the Department of the Mechanics of Fluids) at Manchester, gaining his M.Sc. in the following year and his Ph.D. in 1953. He was supervised by Austin Mair, Paul Owen and James Lighthill and worked in the newly emerging, highly important field of aerodynamic noise; producing experimental confirmation of certain aspects of Lighthill's pioneering theoretical work on this subject. After completing his Ph.D., he joined the Royal Aircraft Establishment, Farnborough, to work on supersonic flow problems.

In January 1956, at the invitation of Paul Owen, Jack returned to Manchester as Lecturer in the Department of the Mechanics of Fluids. There he became principally involved in instrumentation and electronics work, including the making of pressure gauges, for the laboratory's early shock tube and later for a much larger shock tube acquired from Harwell. His earlier work on noise then stimulated his interest in bluff body flows and this remained of major importance to him throughout the rest of his working life. By 1960 he was engaged in hot wire and oscillatory pressure measurements in bluff body flows. His first measurements were of fluctuating surface pressure, leading to estimates of oscillating lift and drag. Subsequently he went on to make measurements with single and multiple hot wires. Large effects of free stream turbulence level were discovered and three-dimensional effects investigated as well as wake development far downstream.

As a result of correspondence with the ONR around this time, he made his first trip to the USA, visiting Penn. State University and met Kovasznay, Corrsin, Morkovin and Phillips at Johns Hopkins University.

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He then turned his attention to numerical analysis and made the first application of the discrete vortex method to bluff body wakes. This included modelling the shedding process at the body. By 1962 he had evolved the theory of the mechanics of the vortex formation region behind bluff bodies at high Reynolds numbers. Together with his research student, Susan Bloor, he measured wake vortex strengths behind a circular cylinder and discovered in the separated shear layers the transition waves preceding turbulence. The resulting two papers on transition and vortex formation are probably those most frequently cited. Certain people in the field (Morkovin and Zdravkovich) have given the name Bloor–Gerrard waves to these transition waves. Mark Morkovin has been kind enough to say that Jack taught him more about bluff body wakes than anyone else.

He was a Senior Foreign Scientist Research Fellow at Penn. State University in 1965, during which some of his major work on bluff body wakes was published or submitted for publication. Around this time he formed a friendship with the late Professor Rudolph Wille of the Berlin Technical University and this resulted in visits to each other's institutions. Correspondence with Turgut Sarpkaya, then at Nebraska University, resulted in a Manchester visit of a few months' duration by Sarpkaya in 1967. Jack had already visited Sarpkaya at Nebraska in 1966 on the way to an IUGG-IUTAM Conference at Kyoto, Japan, to deliver a paper on transition in a separated boundary layer. There was then a pause in his work on bluff body wakes as he turned his attention to medical fluid dynamics, where he also made significant contributions.

Jack's involvement with bluff body wakes became resurrected as a result of an invitation to be the lead speaker at the 1970 Cambridge Euromech meeting on Bluff Bodies and Vortex Shedding. In view of the deficiencies of point measurements with hot wires, Jack applied to the Science and Engineering Research Council (SERC) to finance the building of a large towing tank. A second SERC grant followed for the construction of an interferometer so as to measure water surface deformation. Later studies of water flow patterns behind towed cylinders were conducted with several research students, resulting in further publications in the Journal of Fluid Mechanics.

In 1974 Hiroyuki Honji from Taneda's department at Fukuoka spent a year working with Jack on towing tank experiments. An account of the subsequent substantial work on flow visualisation of bluff body wakes was published in 1978. Numerical modelling began again with two research students, Areski Slaouti and Mike Benson, the latter taking the important step for low Reynolds number flows of modelling the flow by separating the crucial process of vorticity diffusion from convection by use of a grid method. Publication of this work led to a general recognition of its importance and an invitation to attend the Stanford meeting on Complex Turbulent Flows during 1980–81. Jack's expanding interest in numerical methods prompted further application to bluff body flows and this led to a series of three papers in 1989, written in conjunction with Mike Benson and Jack's Manchester colleagues, Peter Bellamy-Knights and Ian Gladwell.

Formally, Jack retired from the University in 1996 although subsequently he could often be found working in his laboratory at Barton. Thus he remained immersed in his researches throughout his adult life. Always the practical man, he had the hands within which tools moved easily and precisely. Much inclined to keep his own counsel, laconic when moved to speech, he could often give the impression of reserve, even of having little interest beyond his work. This, however, is misleading since he possessed a quick, ready though dry sense of humour, showed great generosity towards his friends and colleagues, remained throughout his adult life devoted to his wife and family and a keen, active supporter of his local church. This quiet, thoughtful man contributed much to our understanding of bluff body flows and will be very much missed.

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