

## BOOK REVIEWS

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*The life and legacy of G. I. Taylor*, by George Batchelor, Cambridge University Press, 1996, xv + 285 pp., \$75.00, ISBN 0-521-46121-9

Sir Geoffrey Ingram Taylor was and is “G.I.” to most of the mechanics community, and his memory is held in affection even by people who knew him only by reputation. George Batchelor of the Cambridge Department of Applied Mathematics and Theoretical Physics edited G.I.’s collected papers (during which process the subject continued publishing!) and has produced several shorter memoirs. This definitive biography merges and amplifies the earlier material and contains extensive quotations from G.I.’s own reminiscences. There is very little mathematics in it and comparatively little technical detail that would trouble a nonspecialist. As one would expect from Professor Batchelor, it is a dispassionate account, free of the exaggerations or euphemisms that sometimes mar people’s books about their friends and heroes. However, it does give a rounded and readable account of G.I.’s scientific and personal life. Despite the rather high price, it promises to have wide appeal among people whose professional competence somewhere intersects G.I.’s and, one hopes, among students and others who need reminding that science can be fun.

G.I. was an uncomplicated person—“natural,” “modest, gentle, lovable,” “his simplicity of character and outlook was a source of great scientific strength,” says the biographer—interested in mechanics and in sailing, good humoured and well mannered, but “not a good conversationalist,” and evidently not over-given to thinking about political or philosophical matters and the searchings of conscience they can stimulate. Professor Batchelor remarks that the books found in his house after his death did not indicate much interest in serious literature, but in a 1924 letter to his wife-to-be G.I. makes some appreciative and quite percipient comments about the metaphysical poet John Donne; he had evidently been reading poetry for pleasure.

The frontispiece of the book is the Ruskin Spear portrait of G.I., which I always feel makes him look coarse and lumpy: this may be just the painter’s technique, particularly with the hands, but one wonders if the artist, presumably unacquainted with G.I.’s scientific work, saw him as simple (which he was) and uninspired (which he wasn’t). More characteristic is the famous photograph of G.I. with his assistant “my man Thompson,” peering through his half-glasses while delicately adjusting an experiment mounted, not even on the traditional tabletop, but on what appears

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to be a workshop tool-cupboard. The tabletop rotating-cylinder apparatus earned him that ultimate prize, his own dimensionless number (Professor Batchelor lists eleven appearances of Taylor's name as an adjective). G.I.'s most noticeable facial feature was the thin, tightly closed mouth, inherited from his mother and, judging from an engraving in the book, from his grandfather, George Boole of algebra fame. In description it seems an unappealing feature, at best expressive only of determination, but in all three generations it looks like the start of a smile. G.I.'s other grandfather was a foundling—but then so was d'Alembert. (With typical attention to detail, Professor Batchelor, assisted by his wife, presents the sad little tale of James Taylor's unwanted arrival in the world.)

G.I.'s research covered a very wide range in fluid and solid mechanics. He was a pioneer of dislocation theory, demonstrated by the behaviour of a "raft" of bubbles, and of the statistical treatment of turbulence, an early interest confirmed by his service as meteorologist on the whaling ship *Scotia's* 1913 exploration of the Grand Banks off Newfoundland, where the SS *Titanic* had recently sunk. In the 1930s he published a series of papers on plasticity concurrently with his most famous papers on turbulence and with the Taylor-Maccoll solutions for supersonic flow over cones. During the Second World War he made several contributions to the fluid and solid mechanics of explosions and their effects. Later in his career he became interested in the breakup of liquid sprays in air and in various kinds of fluid flow at very low Reynolds number. Happily, he contributed a 30-minute movie *Low-Reynolds-Number Flows* to the late-1960s series produced by the National Committee for Fluid Mechanics Films, so there is a permanent record of G.I. in action.

G.I.'s work was typically a combination of experiment and theory, both simplified to the bare bones of the phenomenon he was investigating (in some cases he used the experimental results of others, as in his beautiful analysis of a terrible phenomenon, the energy release of the first fission bomb). He used higher mathematics when he needed it, and his analysis of the statistics of turbulence time series was an inspiration to Wiener (recall that even Einstein had to call on a friend's help when he needed Fourier transforms). George Batchelor comments that G.I.'s attitude to error estimates in experimental data was somewhat casual, but he was so in tune with physical phenomena that he must have had a sixth sense of what was trustworthy. The simple approach became less effective after the Second World War when "big science" used more and more complex and expensive techniques to attack mainstream problems, but G.I. still found important, not necessarily popular, problems to solve by simple methods. Everyone interested in G.I.'s work will have their favourite example: mine, I think, is the theory of why a paint roller distributes its contents so efficiently.

Sailing was G.I.'s chief relaxation, and he confessed many years later that he was prouder of the award he was given by the Royal Cruising Club for the best cruise of 1927 than of any other award in his career. G.I. being the sort of person he was, one accepts this as the truth and not inverted snobbery! Perhaps his most remarkable nautical achievement, almost unrewarded financially, was the invention of a new and greatly improved anchor, to be seen today in any port—remarkable because the safe mooring of ships has exercised man's mind for thousands of years. His wife often accompanied him on his voyages and also on an adventurous coast-to-coast walk across Western Borneo. Another reviewer has remarked that Stephanie Taylor is a "cipher" in this book: that is unfair, because when she appears she does so

as a very definite personality, and by all accounts the marriage was a happy one. Unhappy marriages furnish more material for a biographer.

There is, of course, no accounting for genius unless one believes that it is the special gift of God. Neither G.I. nor his near-contemporary Rutherford strikes one as touched by God, but just as two uncomplicated, though very different, people whose natural talents were amplified by the pleasure they took in their work.

Two thousand years ago, Virgil wrote “Happy is the man who can understand why things happen.” G.I. Taylor spent his life finding out why things—the things that interested him—happened and delighted in the process as well as in the result.

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