L. A. PARS
1896–1985

OBITUARY

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Leopold Alexander Pars was born at Whittlesford, a village six miles south of Cambridge, on 2 January 1896, the only son of Albertus McLean Pars and Emma Laura Pars (née Unwin). His father, an accountant who at that time worked for a manufacturer of agricultural machinery, was an accomplished church organist and pianist. In 1899 the family, which also included a daughter Dora born in 1892 and their much-loved nursemaid and housekeeper Aleathea Starling, moved to Shepherd's Bush, and in 1926 to the house in Acton which (except for interruption by War) remained the home of all five for the rest of their lives. The son, known to his family as 'Leo'—though he was universally known as 'Alan' in Cambridge after the Second World War—attended Latymer Upper School at Hammersmith, from which, in December 1914, he won a Foundation Scholarship in Mathematics and Physics to Jesus College Cambridge. (He named this College as his first choice because his father greatly admired James Robertson, vicar of Whittlesford and a former Fellow of Jesus College—which has been Patron of the living of St Mary and St Andrew, Whittlesford from 1558 to the present time.)

Pars entered Jesus College to read Mathematics in October 1915, but was dogged by ill-health and, after missing some terms, delayed taking Part I of the Tripos until 1917, when he obtained a First Class. Two years later he followed this with a First in Part II with Distinction in Schedule B (the fore-runner of the modern Part III) and, as was the custom in those days, took the London B.Sc. externally and registered First Class Honours there as well. He subsequently took the London M.Sc., and crowned his academic record by winning the First Smith's Prize in 1921. Although the citation gave 'On the General Theory of Relativity' as his title, this actually referred only to the second part of the long essay he submitted on 'Vector and Tensor Fields', of which the first part was devoted to 'Geometrical Vector Theory and the Restricted Principle of Relativity'. In its introduction he acknowledged the help and influence of Arthur Eddington, whom he continued to hold in particularly high esteem, and also thanked Joseph Larmor for helpful suggestions. His first published paper [1] was adapted from two important chapters in the first part of his prize essay.

Pars's brilliant record led to his election, in May 1921, into the Fellowship of his College which he held until his death at the age of 89 on 28 January 1985. At the time of his election Jesus College had a popular reputation based more on its oarsmen than its scholars, and a mere dozen Fellows. Among the dozen was Pars's greatly admired master, the redoubtable William Welsh, Senior Wrangler in 1882 and First Smith's Prizeman in 1883 (the last year in which the prize was awarded on examination), an outstanding teacher and a golfer of unusual ability. (Pars had himself taken part in athletics at school, and used to say that the sporting achievement he most coveted was winning the Mile in the inter-University sports.) He soon became fully involved in the work of the College, following Welsh's example of meticulous, lucid and

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inspiring teaching over the whole range of Tripos subjects. (He was, indeed, recommended by the mathematical don at Girton College, to her students seeking coaching, as one of a number of 'Pure young men' whom she had discovered.) In 1923 he was appointed Praelector, in which capacity it was his duty to present to the University undergraduates for matriculation and graduands for their degrees. Naturally gregarious, with a particular liking for the company of the young, he was an outstanding success in this rôle, for his duty of knowing every junior member of the College precisely matched his inclinations. For half a century the rooms on 13 Chapel Court which he occupied in term time from 1930 (when they were built) until a few months before his death were among the first ports of call for many Jesuans revisiting their old College, and remained so, long after he relinquished the Praelectorship in 1946.

William Welsh died in 1925, and Pars assumed the responsibility for directing the studies of the mathematicians at Jesus College. In 1927, soon after the comprehensive reform of University and College Statutes, he became a University Lecturer in Mathematics. He was elected to membership of the London Mathematical Society in 1934.

The mathematical side at Jesus College between the Wars was small but sound, and contained a sprinkling of outstanding men, notably Jacob Bronowski, A. E. Green, J. S. Sawyer and I. J. Good. Pars taught them all, with his characteristic blend of lucidity and elegance of expression and great breadth of knowledge; and he also taught Mathematics to some physicists (including Denys Wilkinson) and engineers. He remained Director of Studies at the College until 1951 and a University Lecturer until 1961. Two years before his retirement he was claimed as a founder-member of the Department of Applied Mathematics and Theoretical Physics when it crystallized out of the hitherto undifferentiated Faculty of Mathematics; but as a teacher, lecturer and author he can best be appreciated as a mathematician *tout court*, and not merely as a specialist in analytical dynamics or even as an applied mathematician. He seemed essentially a College and Faculty man, a true successor to Welsh surviving into a more specialised age; and it would have been easy to suppose that his influence, like Welsh's, might have been restricted to the circle of his pupils and colleagues in his College and University.

This impression, though strengthened by the contrast between the somewhat sparse list of his original papers and his able and versatile performances as expositor, examiner and administrator (he was a successful Chairman of the Faculty in the difficult years 1945–48), was in the long run seen to be mistaken. He had indeed published a valuable textbook *Introduction to dynamics* [8] in 1953, limited in scope but written with all his formidable powers of clear thinking and lucid exposition. But, more significantly, the work for which he will be chiefly remembered was still undergoing its long gestation, as he worked steadily on accumulating, collating, refining and polishing his extensive material. When his monumental *Treatise on analytical dynamics* [12] finally appeared in 1965, four years after his retirement, he referred in his Introduction to 'taking leave of an old and agreeable companion'.

In the meantime he lived a bachelor existence, divided between his rooms in College and his home in Acton, interrupted only by the sabbatical year 1948–49 which he spent at the Institute for Advanced Study at Princeton and the University of California at Berkeley. He had a wide and informed interest in plays and the opera, and was a most generous host, especially to junior members of his College, whom he would invite to join him on country walks, holiday journeys or visits to the theatre.

(A pupil of his to whom he introduced Mozart's operas in pre-War Cambridge recalls catching sight of him, forty years later, at Covent Garden with another undergraduate in tow.) In his younger days he was a keen mountaineer, and when in middle-age he spent holidays in the West Country (developing a particular love for Combe Martin in North Devon) he would still exercise his prowess on the rocky coast—as indeed he did on tempting trees on his frequent term-time walks in the flat Cambridgeshire countryside, to the astonishment and admiration of the pupil who often accompanied him. He had inherited his father's love of music and some of his skill, but restricted his public performances to convivial gatherings in his rooms, where he would accompany on the piano the singing by colleagues and guests of Edwardian music-hall songs and selections from Gilbert and Sullivan. (After college feasts he would sometimes persuade Sir Harold Scott, an Honorary Fellow who was Commissioner of Police for the Metropolis, to perform 'A policeman's lot is not a happy one' from the Pirates of Penzance.) In 1958 he became President of Jesus College, an office whose duties—at that time almost wholly social—suited his friendly disposition, invariable courtesy (especially to strangers) and keen interest in his fellow-men as perfectly as did those of his earlier office of Praelector.

The years immediately after his retirement in 1961 saw the publication of another textbook, *An introduction to the calculus of variations* [11] in 1962, and his *magnum opus* [12] in 1965, the distillation of his life's work on analytical dynamics. His aim was to give a compact, consistent and reasonably complete account of the subject as it then stood. He based his treatment on the theorem of Lagrange that he called the *fundamental equation*, which he proceeded to translate into six different forms, each exploited in appropriate contexts. The book at once won critical acclaim. In *Mathematical Reviews* V. G. Szebehely wrote 'There are few good books on dynamics; the author's is unquestionably one of them', and went on to describe Pars's treatise as surpassing E. T. Whittaker's *Analytical dynamics* in explanatory remarks and in readability, and as being more detailed and complete than H. Goldstein's *Classical mechanics*. Writing in the *Mathematical Gazette*, T. A. A. Broadbent said: 'The author's paper on variational principles [9] is here expanded into what is surely the last word on the subject for some time to come... It is, I think, not too much to suggest that here is the standard treatise on dynamics for our time.' Its value was confirmed by the publication in Moscow in 1971 of a translation into Russian by K. A. Lur'e. For an up-to-date assessment I turned to the distinguished astronomer Dr W. C. Saslaw, a colleague of Pars's at Jesus College, who writes:

> '*A treatise on analytical dynamics* is a massive, scholarly, systematic 650-page survey of the classical canon of mathematical dynamics. It is an exposition of enormous elegance, rigour and clarity, honed by decades of teaching undergraduate Tripos candidates and broadened by a perspective which encompassed all the major developments in dynamics from Galileo to the mid-twentieth century. Within its context it is a pedagogical master-piece. Even if it has not achieved its author's hope of reviving interest in analytical dynamics *per se*, it has served to crystallize and preserve an era and a style of mathematical physics, a style precise yet leisurely. It is a book which, as Goldstein remarks in his well-known text *Classical mechanics*, 'seems to wear cap and gown, and like Whittaker displays a wealth of erudition'. Complementing these aspects of the contents is the high quality and aesthetic appearance of the original edition. Although the main

motivation behind Pars's treatise was exposition rather than original research, it provides a basis for modern developments in non-linear mechanics, ergodic theory, orbital dynamics and perturbation theory which is as fresh today as when it was written twenty years ago. Having crystallized an age of analytical dynamics, it has itself become ageless.'

Having despatched his great book to the printers in 1964, Pars retired from the office of President of Jesus College and set off on a world tour. This included spells as Visiting Professor at the Florida Atlantic University and at the University of Sydney, but was as much an occasion for visiting old friends, in places as diverse as Trinidad and New Zealand, Tasmania and Uganda, as an academic expedition. Shortly after his return the distinction of his contributions to scholarship was recognised by the award in 1966 of the Cambridge Sc.D. degree.

For some years after his retirement Alan Pars continued to travel widely, including exotic places such as Petra and Machu Picchu among his destinations, frequently with a young friend as travelling companion. After the death of his sister Dora in 1980 he lived alone (except for a housekeeper) at his Acton home, but retained and exercised his rights (as a Fellow under the pre-1926 Statutes) to rooms in College and a seat on the College Council to the end of his life. He kept also his interest in people, dined frequently on High Table and was a familiar sight in Cambridge, taking his regular afternoon constitutional in his characteristic attitude with eyes downcast and walking-stick raised behind. Though by no means an eccentric, he was a great Cambridge character, a survivor from an era which is passing from living memory. His great book should ensure that his place in the annals of mathematics is as secure as that in the history of the College that he loved and adorned for seventy years and which now, through the typically generous provisions of his will, can count him as one of its greatest benefactors.

Publications of L. A. Pars

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2. 'The classification of orbits', *Proc. Camb. Philos. Soc.* 25 (1929) 1–19.
3. 'Note on a paper by Wintner', *Quart. J. Math.* 10 (1939) 135.
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5. 'Collision relations', *Philos. Mag.* (7th Series) 33 (1942) 96–101.
6. 'A note on the envelope of a certain family of curves', *J. London Math. Soc.* 22 (1947) 25–31.
7. 'An elementary proof of Stäckel's theorem', *Amer. Math. Monthly* 56 (1949) 394–396.
8. *Introduction to dynamics* (Cambridge University Press, 1953).
9. 'Variational principles in dynamics', *Quart. J. Mech. Appl. Math.* 7 (1954) 338–351.
10. 'Inequalities occurring in the restricted problem of three bodies', *J. London. Math. Soc.* 32 (1957) 355–356.
11. *An introduction to the calculus of variations* (Cambridge University Press, 1962).
12. *A treatise on analytical dynamics* (Heinemann, London, 1965).
13. 'Edward Carey Francis', *J. London Math. Soc.* 43 (1968) 368.
14. 'A graphical solution of Euler's equations', *Math. Gazette* 57 (1973) 122–129.

Jesus College
Cambridge

D. R. TAUNT