HAROLD SIMPSON (formerly HILTON)

LILIAN G. BUTTON

Emeritus Professor Harold Simpson died in hospital on April 4th, 1974, a fortnight after being seriously injured by an accidental fall in his study.

He was born in Kent on October 22nd, 1876, the eldest son of the Reverend H. G. Hilton. There can be no doubt that he was a lively and clever boy, his first recorded success being the award of an Exhibition to Lancing College. His university career at Oxford was marked by a dazzling sequence of achievements: Scholar of Hertford College (1895–1898), University Junior Mathematical Exhibitioner (1896, 1897), Prize Mathematical Fellow of Magdalen (1898–1905) and University Senior Mathematical Scholar (1899, 1900). Only five years after obtaining his B.A. degree his first book was published. During this period he had, according to his own report, been studying physics, chemistry, crystallography and the mathematical theory of groups and it is interesting that it was this, his book on *Mathematical Crystallography*, which had the distinction of being last as well as first; it was reprinted as recently as 1963. At the time it was written there was considerable interest in the subject at Oxford, stimulated largely by the Waynflete Professor of Mineralogy, Sir Henry Miers, F.R.S., who was also the Editor of the *Mineralogical Magazine*, to which Hilton contributed several of his early papers. In the preface to the book the author modestly disclaims originality, his intention being only to translate and expound the work of others for the benefit of the English reader. At least two of these, Schoenflies and Miers, were still publishing the results of their investigations, so Hilton's exposition was completely contemporary. The juxtaposition of the various current theories together with his own original papers combine to make one suspect that he was undervaluing his own contribution. In a report of 1901 the British Association announced that the geometrical theory of crystals now seemed to be fairly complete. However one chooses to apportion the credit for this achievement there can be little doubt that the report followed a period of significant progress in this field and that Hilton played some part in its development.

The seven years of his Fellowship produced not only his first book but also some twenty papers, mostly on crystallography but including a few which seem to anticipate his later interest in geometry. In fact, at this early stage, the motivation appears to be his interest in astronomy rather than purely geometric curiosity. Apart from this original work he contrived to fit in some lecturing in preliminary physics at Oxford, a term's teaching at Eton and three years as Assistant Lecturer in Mathematics at the University College of North Wales in Bangor. Each year he added to his experience as an examiner, not just the inevitable University examinations in mathematics and physics but many others for would-be teachers, naval officers and civil

servants. Academics often discover in themselves a dormant interest in education when the springs of originality run dry, but for Professor Hilton research and pedagogy advanced side by side. His early concern for the communication of mathematical knowledge would be exceptional in a young mathematician of any generation.

His first post at Bangor terminated with his appointment in 1907 as Head of the Mathematics Department of Bedford College, London. At that time the college, exclusively for women, had premises in Baker Street, but those days are remembered only by a select handful of former students, as removal to the present Regent's Park site took place only seven years later in 1913. By then he must have been one of the most influential and gifted members of its academic staff for in 1912 he became the first holder of a Professorship of London University tenable at Bedford, a position he was to retain until his retirement. Almost from the time of his initial appointment he had been a member of the University's Board of Studies in Mathematics and from 1910 to 1916 he also acted as its Secretary. As a Professor he became an ex officio member of the Board and also of the University Faculties of Arts and Science. He took his administrative duties seriously, eventually becoming Chairman of the Board of Examiners, but he is reputed to have been impatient of the filibustering techniques sometimes employed in committees with less immediate objectives.

A student of 1911–1914 recalls him as a brilliant lecturer of inspiring clarity and an enthusiast for mediaeval architecture. It was at this stage that he developed a phenomenal method of registering a precise mental image of each student, not just for three years at college but for a lifetime. At their first encounter each girl found herself subjected to a brief but piercing scrutiny after which he never forgot her. Any additional information he acquired was immediately linked with the right face and name and at meetings with his old students years later he could always relay up-to-date information about the activities of their contemporaries. I cannot resist the slightly whimsical idea that we were classified rather like the crystals.

At this stage too he acquired his pet name, and he remained Hilly to his former students even after 1939 when he changed his name to Simpson. A change of name so late in life (he was then 63) naturally evoked a good deal of speculation among his acquaintances and, from recent conversations, I am aware that curiosity is still rampant. The facts are as follows: the Rev. George Stringer Simpson in his will of 1888 created a trust under which any beneficiary should, within twelve months of becoming tenant in possession, apply for a royal licence or other proper authority to bear the surname and arms of Simpson. His nearest male relatives were the six sons of his sister Sybilla, wife of Canon Henry Hilton, and the eldest of these, the Rev. William Hilton, duly changed his name. He was eventually succeeded by his son, Melville, the Algerian explorer and ethnographer, who had only one daughter. Consequently on his death in 1938 Professor Hilton, eldest son of Sybilla's second son Henry, succeeded to the inheritance and changed his name in accordance with the testator's wishes. In confirming the common conjecture that he made the change to meet the conditions of a bequest it would be grossly unfair to allow the false corollary that he was mercenary. While his own life-style remained simple he used the additional income to help others unobtrusively. One old student recalls a time of great financial distress when he tried to convince her that it was really his duty, as her

old professor, to come to her assistance, and only recently the Principal of Bedford revealed that Professor Simpson was unique in subscribing annually to a college fund for helping students in temporary financial need.

It was during his first few years at Bedford that his interest in crystallography was modified by a growing preoccupation with group theory in general rather than with its specific application. He never abandoned the subject entirely; for nineteen years between 1908 and 1942 he was a member of the Council of the Mineralogical Society and he continued to make contributions to journals concerned primarily with crystallography, but by 1908 he had completed his second book *The Theory of Groups of Finite Order*. Once again his professed aim was to provide an easier progress towards an understanding of contemporary research papers, and to this end it contains a fantastic collection of examples together with hints for their solution. Professor Burnside himself contributed some unsolved problems for the appendix and it is surprising how informative a text-book of this calibre can remain so long after its initial appearance.

In 1913, only a year after obtaining his chair, he was awarded his D.Sc. and the following year saw the publication of his third book on *Homogeneous Linear Substitutions*. There seems little connection between this and the two previous books but the papers he had been contributing to the *Proceedings* of the London Mathematical Society and to *Messenger of Mathematics* anticipated the new trend in his thinking and inevitably culminated in the presentation of yet another aspect of contemporary mathematics in book-form. The subject matter includes properties of real and complex matrices, Hermitian and bilinear forms, and applications to linear differential equations and to geometry. For the present-day reader the old terminology is a slight deterrent (e.g. " pole " for " eigenvector " and " cyclant " for " circulant ") but many of the examples he invented have become the hardy perennials of more recent text-books and it seems likely that there are more references to his papers on this subject than to any other section of his published work.

The years of the First World War saw yet another change in his mathematical interests. I have been unable to trace many publications during the period 1913–1917 but, from 1918 onwards, apart from a resurgence of contributions on the geometric aspects of crystallography, there is a long sequence of papers on various types of plane algebraic curves. In 1920 these results were incorporated in his last, and possibly now best-known book, *Plane Algebraic Curves*. This is unfortunate because the aspects of geometry in which he was interested were fast becoming obsolete. The Baker school flourishing in Cambridge was making considerable advances on the much more general invariantive and non-metrical front, so his preoccupation with the circuits and singularities of plane cubic and quartic curves seems of comparative unimportance. In spite of this there may be others who, like me, will enjoy the composite " modern art " illustrations of many types of plane quartic in (66) and (68). His papers also include contributions on spherical trigonometry and differential geometry. One of these (82) was instantly generalized to n dimensions by J. L. Synge, using tensors. This is a significant indication that here too geometry was moving away from Hilton's interests.

It has seemed to me inappropriate, after an interval of nearly thirty years, to follow the usual practice in the *Bulletin* of analysing his mathematical contribution in great detail, even paper by paper. Much of what he was doing has already been absorbed into the mainstream of mathematics. His results in group theory and matrices are so generally known now that it is difficult to appreciate those early efforts which enable us, sixty years later, to teach the results to undergraduates. As he himself provided at the end of each stage a summary, in book form, of his current mathematical interest, it seems to me that the most illuminating way of assessing his work is to read the relevant book, at the same time making some attempt to imagine the impact it would have made when the contents were brand-new. There are some attractive byways, not mentioned in the books, on quasi-symmetric substitutions and the distribution of eigenvalues, and the occasional combinatorial-type argument in his papers on groups is refreshingly contemporary.   I believe that the bibliography at the end of this article is complete; none of the papers is of great length and most of the titles indicate clearly to which section of his work they are linked.

Between the wars his influence both in the College and in the University increased as the years went by. As Chairman of the Board of Examiners for the B.A. and B.Sc. Special and General degrees he often pronounced a Russian-type veto on any question he considered beyond the capabilities of his young ladies, and to the bright young men of the day he seemed a shade reactionary towards any proposals to revise the syllabus.   Then, in 1939 at the outbreak of war, the London colleges were scattered by evacuation and Bedford went into exile in Cambridge. In mathematics the lecturing resources remaining to Bedford and Queen Mary were pooled and Professor Simpson extended his range by lecturing on dynamics. The problem of maintaining a corporate college spirit was insuperable but the house in Fitzwilliam Street was the nucleus of a very close-knit mathematics department. Here the weekly set of six problems appeared each Monday morning and here the students returned like homing pigeons after lectures in Mill Lane or the Arts School. Professor Simpson himself provided tutorials (complete with army blankets to keep out the cold) for every one of his finalists. That meant a total of at least six hours a week and he still found time to be a hockey referee and a cricket umpire.

It is a temptation to claim that his life was spent in the service of Bedford students but that would be an exaggeration. It is true that up to the end he maintained a vital contact with many of them but it would belittle him to imply that all of his effective contribution to life was made before 1944, the date of his academic retirement. He did then give up mathematics but for several years he worked steadily for an organization which provided books for seamen. It is difficult now to realize how worthwhile this activity was in the immediate post-war years.   There was little glamour attached to it but Professor Simpson mended and collected and sorted books of all descriptions knowing that some of them would meet a need somewhere. Later, with the same fidelity, he transferred his energies to Oxfam for which organization he continued to work until the time of his fatal accident.

He became a life-member of the London Mathematical Society in 1899. Remaining a member for 75 years is a record not easily surpassed, but yet another is that for nearly 30 of those years (1915–44) he was also a member of the Council. On the

occasion of the Society's Centenary celebrations a group of younger mathematicians enjoyed looking back with him at the early signatures in the members' book. He recalled Cayley and Sylvester and it was fascinating to discover that, to him, Bertrand Russell was a comparative newcomer! Even then, in 1965, there was no other member dating from the 19th Century and there are now at most four survivors from the first decade of the 20th. He had no taste for malicious gossip but on one occasion, thinking my confidence needed a boost, he recalled with a twinkle in his eye a lecture given to the L.M.S. by a slightly pompous young man, later a professor, who failed to recognize the polar equation of a conic.

Although Lewis Carroll must still have been part of the Oxford scene during his student days I do not know whether they met, but they did have in common a love of children and neither had children of his own. Professor Simpson's first marriage ended in the tragic death of his wife and it is a tribute to his character that he was not embittered by the strain of this period of his life. Fortunately he contracted a belated, and extremely happy, second marriage in 1962. His second wife had known him for many years; as a little girl of seven years old she had lost her heart to the dashing young lecturer who came to take Sunday tea every week with his tutor, her uncle, E. B. Elliott. She was the first of many children to fall under his spell. Over the years he acquired a sizeable collection of godchildren and the reputation of being one of those rare adults able to enjoy a good game of leapfrog immediately after Sunday lunch. Possibly his concern for their happiness as well as their good endeared him to the young. He had a liberal attitude too to his younger colleagues who, in his view, needed free time to take exercise; and he was much ahead of his time in encouraging leave of absence for maternity in preference to resignation.

Some time during his boyhood the family moved to Cornwall and it must have been then that his life-time affection for the West Country began. Inevitably, given his enthusiasm for fitness and exercise, his visits to his younger brother in Totnes expanded into an annual cycling tour from Taunton to Truro visiting old friends and past students on the way. It was only as an octogenarian that he, with some reluctance, augmented his own pedal power with the horse power of the train. Later still the boot of his wife's car accommodated a " two-piece " bicycle which could be assembled for a quiet country ride once the heavy traffic had been left behind on the main road. A month before his death he had been featured in an Oxford paper as the oldest cyclist in the town, beating the runner-up by three or four years.

In his memorial address Bedford's Principal Dr. J. Black, attributed to him that rarest type of recognition bestowed on members of the academic community, the devotion of their students. In Hilly's case this was the inevitable response to a life-time's dedication on his part. During his thirty-seven years at Bedford he acquired an enormous family of academic daughters and the mutual affection which survived nearly thirty years of retirement was maintained equally by their attachment to him and his continued interest in them. From 1946 onwards his students, including the mathematicians and physicists, the rowers, the hockey and cricket players and many more, celebrated his birthday with an annual reunion at Bedford. They will remember him not only as a fine mathematician and a great teacher but chiefly as a very dear friend.

I am much indebted to Dr. Black and to Mr. G. Paterson, the Librarian of Bedford College, who were so generous with their help, supplying me with information which I could not otherwise have obtained. For personal details I owe many thanks to Mrs. Dorothy Simpson who, despite illness, gave me all the assistance that was in her power. Dr. James Henderson, Professor J. G. Semple and Professor G. Temple kindly contributed academic and administrative recollections which, because of some overlap, I have included without direct acknowledgment.

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