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SIR ALFRED BRAY KEMPE, 1849-1922.

AMONG the losses which the Royal Society has recently sustained none has evoked deeper regret than the death of Sir Alfred Bray Kempe, who for twenty-one years, as its Treasurer and one of its Vice-Presidents, took a leading share in the management of its affairs and in the promotion of its prosperity. Some grateful record of his career could not find a more appropriate place than in the pages of the 'Proceedings' of the Society with which he was so long and so closely associated.

The third son of Prebendary John Edward Kempe, Rector of St. James's, Piccadilly, he was born on July 6, 1849. From St. Paul's School, as Camden Exhibitioner, he passed to Trinity College, Cambridge, where, in 1872, he took his degree with special distinction in Mathematics. In the same year he published his first mathematical paper, the title of which—"A general method of solving equations of the n th degree by mechanical means"—showed the bent of his mind in scientific enquiry. For some years he continued to publish mathematical essays, but having chosen the Law as his profession, and become a Barrister of the Inner Temple and Western Circuit, he was soon immersed in legal business. To the last, however, he never wholly relinquished his mathematical studies. He used to say of himself that his favourite recreations were Mathematics and Music. He was hardly ever without some problem at which, in such leisure as he could find, he steadily worked. But he refused, as he said, to "empty his note-books into the 'Proceedings' of the Royal Society." He would not be induced to publish his studies until he had really got to the bottom of his enquiry.

In the early part of his legal career, before he became an authority on Ecclesiastical Law, he met with some of the amusing incidents which vary a barrister's experiences, and these he used to tell with great glee. There was one of his stories in which he related how, as a young lawyer, he had been sent to Germany to take evidence for a case in Court, but had his proceedings interrupted by the authorities and was actually arrested on a charge of "usurping the functions of the German Kaiser!" He was soon released, however, on the score of his ignorance of the law—a palliation which he laughingly said was rather hard on a barrister.

Sir Lewis Dibdin, Dean of the Arches, who of all his legal comrades was perhaps his most intimate associate, has been so good as to supply for this record the following recollections of Kempe's life as a barrister.

"I first came in contact with Kempe in 1881 when he was Secretary of the Ecclesiastical Courts Commission which reported in 1883. This important body, included Tait, Benson, Stubbs, Westcott, Freeman, Jeune and many other distinguished members. Kempe impressed them all by his admirable work and knowledge. Chancellorships began to drop in, and he soon became

one of the few recognized authorities on Ecclesiastical Law at the Bar. He was one of the Bishop's Counsel in the Lincoln case and also appeared before the Archbishops at the Lambeth Hearing on 'Reservation.' His opinion was sought in a great number of Church cases, and in the much rarer event of proceedings in Court, Kempe was almost certain to be briefed on one side or the other. In 1912 he obtained the 'blue-ribbon' of the Chancellorships—the Chancellorship of London—and as his health was not very strong, ceased to appear as counsel in Court though, I believe, he still advised on 'cases.' In 1913 I asked him and the late Sir Charles Chadwyck Healey, K.C.B., K.C., to act jointly with myself as a committee formed at the request of the Archbishops to ascertain what steps were being taken to secure protection for Church fabrics and to report and make recommendations to their Graces. Kempe contributed a valuable memorandum as to the law of Faculties, which was printed with the Report dated July, 1914. The War probably prevented the Report's recommendations, which were unanimous, from receiving more attention. Kempe's reported judgments in the Consistory Courts over which he presided are not numerous.

"He was an admirable lawyer. His logical mind, coupled with real learning and knowledge of cases, made his opinions clear and sound. It was a pleasure to be associated with him in the consideration of legal questions. While his own arguments were easy to follow, it was equally easy to make him follow those of other people. As an opponent in Court he was not less satisfactory. Always courteous and rigidly fair, he could be relied on to put a winning case convincingly. He was not made for the rough and tumble of contentious advocacy. I think his amiable and refined temperament rather revolted from it, and he was not at his best with a bad case. Probably the clarity of his mind made it difficult for him to argue a rotten point. It would be true to say that he so conducted his own side of a case as always to win the respect of an opponent, while if one had much to do with Kempe, respect inevitably ripened into a warm regard and affection."

The Secretaryship of the Royal Commission on Ecclesiastical Courts lasted for two years. The recognition of the Secretary's growing mastery of Ecclesiastical Law naturally led to the "dropping in" of Chancellorships of Dioceses above referred to. In the course of years Kempe held the Chancellorships of Newcastle, Southwell, St. Albans, Peterborough, Chichester, Chelmsford, and finally that of London which he filled for the last ten years of his life. He also became a Bencher of the Inner Temple. It was in the early part of his career that he found most time to prosecute his researches in the department of mathematics which had specially attracted him. The papers published by him previous to 1879 were the ground on which he was, in that year, proposed for election into the Royal Society. The Certificate wherein his proposers narrated his claims described him as "distinguished for his knowledge of and discoveries in Kinematics." It was signed by a group of the foremost mathematicians of the day, including Cayley, Sylvester, and others. He duly became F.R.S. on June 2, 1881. His friend

Major P. A. MacMahon, F.R.S., well known for contributions to a kindred department of science, has been so good as to furnish for this Obituary the following appreciation of his mathematical work:—

“Kempe’s chief contribution to Mathematical Science was his ‘Memoir on the Theory of Mathematical Form’ (‘Phil. Trans. R.S.’ 1886). He considered the subject matter of mathematical thought to consist of a number of differing and non-differing individuals and pluralities, and that the duty of the mathematician is to investigate the characteristics of such matter. Usually the subject matter of thought is accompanied by what he termed ‘accidental clothing,’ which may be geometrical, algebraical, logical, etc., and his object was to separate it so as to present it in its bare form ready for any raiment that the investigator may find to be appropriate. These bared mathematical forms exist in infinite variety, and any one *may* appertain to subjects of thought which to all appearance have little or nothing in common.

“A classification of *forms*, in the sense used by Kempe, involves the classification of all the matters that may be subjected to mathematical thought and processes. Every subject matter is, in his phrase, reduced to *necessary* subject matter, and he shows wherein consists the infinite variety which the necessary matter exhibits. He studies the nature of the collections of individuals and pluralities, but restricts himself to an exposition of the fundamental principles. After setting forth the definitions and elementary developments, he shows the applications to a variety of cases in such a manner as to vindicate clearly the basic principles of the study. He also describes a simple and uniform method of separating, in any given case, the essential from the non-essential material. He puts in evidence, to this end, a collection of ‘units’ which may be distinguishable or undistinguishable, and grouped, or not, into pairs, triads, . . . *n*-ads. He shows that every collection of units has a definite *form* due (i) to the number of its component units; (ii) to the way in which the distinguished and undistinguished units, pairs, triads, etc., are distributed throughout the collection. To quote his own words, units may denote ‘material objects, intervals or periods of time, processes of thought, points, lines, statements, relationships, arrangements, algebraical expressions, operators,’ etc., etc., and may occupy various positions and be otherwise variously circumstanced. It is thus evident that he took a comprehensive view of the work discussed in the memoir.

“In the course of his masterly development, he brings himself into contact with W. K. Clifford’s papers ‘On the Types of Compound Statement involving Four Classes’ (Proc. Man. Phil. Soc., vol. 6, 3rd series), with Grassmann’s ‘Extensive Algebra’ (‘Amer. J. of Math.’ vol. 1, pp. 350 *et seq.*), and with Venn’s well-known work on ‘Symbolic Logic.’ In particular, he carries the principles far enough to include primitive and compound algebras, and is able to exhibit the ordinary algebra of quantity as one compounded of two primitive algebras.

“It was the desire to see the subject matter of thought in its absolutely lowest terms that dominated Kempe’s mathematical activity during the twenty years (1875–95) in which he published his work. He was President of the London Mathematical Society for two years. When he retired from the Chair in 1895 he recurred again to the subject in his valedictory address. In that discourse he discussed the question—What is Mathematics? He referred to answers to this question that had been given by John Hopkinson, Civil Engineer, and by Venn, Logician, from their special points of view. He quoted De Morgan as saying that ‘Space and Time are the only necessary matters of thought, and thus form the subject matter of mathematics,’ and Benjamin Peirce as responsible for the statement, ‘Mathematics is the science which draws necessary conclusions.’ He did not find these replies satisfactory, and doubted whether either was likely to have effect upon the march of mathematical research. He had in mind a definition which might be effective in promoting research by suggesting new paths, new processes, and new classifications and co-ordinations. At the conclusion of his address he is led to the reply upon which he had founded his theory of Mathematical Form nine years before. He did not regard it as being a perfect definition, but as the best that he had been able to devise, and he looked forward to a better one being forthcoming at some future time.

“There is no doubt that his ideas enabled him to visualise a mathematical question, and, indeed, almost any subject of thought, in a novel, interesting and suggestive manner. By means of his graphs of points variously coloured, placed in certain relative positions and connected (or not) by lines, single or multiple, variously distinguished, he was able to form a mental picture of any subject of thought, and to ascertain the nature and extent of the essential differences between different subjects. In this respect he perhaps resembled W. K. Clifford more than any other mathematician ancient or modern. This was recognised by those who had the responsibility of dealing with Clifford’s posthumous papers, so that the advice and assistance of Kempe was sought, to the great advantage of science. It should be mentioned that Clifford had visualised, in the Kempe manner, much of the theory of Algebraical Invariants, at that time a comparatively new study, but had met at a certain point with difficulties which at the time of his death he had not succeeded in surmounting. Kempe, however, had gone somewhat deeper than Clifford into the graphical representation of mathematical form, and, moreover, possessed just that knowledge of the theory of Invariants which enabled him within a short time to fill up the lacunæ in Clifford’s work. It is safe to say that at that time no one but Kempe could have achieved this. He was the one mathematician qualified for the task.

“Early in his career he was interested in Linkages, a subject which came to the front by reason of the discovery by Peaucellier—an officer in the French Engineers—of a linkage which would draw a straight line. The

want of such a mechanism had been felt in engineering practice. Watt, in his steam-engine, had adopted a linkage for guiding his piston, which was an approximate straight-line motion, but the exact solution of the problem had been regarded as an impossibility. Peaucellier's discovery infused new interest into the subject, and other linkages which drew straight lines or arcs of circles of given very large radii were soon forthcoming. Kempe, early in the field, gave a delightful series of lectures in Kensington with the title 'How to Draw a Straight Line,' in which he described Peaucellier's discovery and the subsequent developments. These discourses were published in 'Nature,' with many illustrations, and probably constitute the best existing account, both popular and scientific, of the subject.

"He wrote several other papers, mostly on algebras with particular laws, which all bear the impress of his ability to get down to bed rock in any subject that was occupying his mind. His legal training led him in all cases to lucid and exact statements. His mathematical work, though not large in quantity, was first-rate in quality. What he put forward for publication was his best, and he will be always remembered as a noteworthy contributor to the Philosophy of Mathematics."

The publication of his mathematical papers established Kempe's reputation as a man-of-science. But the philosophers quickly discovered that he was also an excellent man-of-business. In 1897, he was elected into the Council of the Royal Society, where he soon took a leading place. Accordingly, in the following year, when the Treasurership of the Society became vacant, the Council resolved to propose him for election to this important office. Some of the elder and more conservative Fellows, however, were not prepared to place a comparatively young man in a post which they thought should always be filled by a man of years and of long experience. The general body of the Society supported the President and Council, and Kempe was duly elected Treasurer on St. Andrew's Day, 1898, an office which, combined with that of Vice-President, he worthily held for twenty-one years.

A barrister who in his full professional career would undertake the exacting labours of this Treasurership showed no little courage. Yet from the beginning to the end of his tenure of the office Kempe devoted himself with unstinted zeal not only to his special financial duties, but to the general multiplied business of the Society, as if he had no other vocation in life. It was apt to be forgotten that the time which he gave to the work of the Society was found by him in the midst of all the claims of his profession. The general body of the Fellows thought of him not as the eminent lawyer, but as one of themselves, a notable man-of-science who had undertaken to guide the financial affairs of their Society, and who at each Anniversary gave a brief account of his stewardship. His report on these annual occasions formed one of the most interesting features of the meeting. With great clearness, and often with not a little humour, he would sketch the financial position of the Society, and the state of the funds and investments under his charge. He

made himself familiar with the history and purport of the numerous trusts which he had to administer, and he took care to revise and keep up to date the account of each of them given in the Society's 'Record.'

But only his colleagues in the Council could be fully aware of the amount and varied nature of the work which he accomplished for the Society. Besides mastering the business of the Council, he was an active member of many Committees, especially of those which involved expenditure of funds, where his presence as "financial assessor" was of service. His clear common sense, legal knowledge, wide experience of men, and gift of clear exposition, gave to his opinion great influence in the Council, and contributed, in no small measure, to shape the policy and sustain the prosperity of the Royal Society.

It was always interesting to observe with what energy and evident enjoyment he would plunge into a complicated piece of business and gradually reduce the confusion into intelligible order. A remarkable instance of this strong mental grasp was afforded in 1905. At that time the Statutes of the Society, in consequence of successive alterations and additions, stood in such need of revision and consolidation that a special committee was appointed to deal with the matter. The Treasurer found the task to be eminently congenial to him, but to be also more easily accomplished in the quiet of his home than amid the discussions of the committee-room. Taking his copy of the Society's 'Year-Book' he entirely recast the chapters on the Statutes, removing some of them into the class of Standing Orders, and making many alterations, additions and improvements, in the direction of clearness and precision. The volume in which he wrought this transformation, together with the inserted slips and pages of fresh manuscript, has been preserved, and through the kindness of Lady Kempe is now placed among the archives of the Society. A comparison of its contents with the new Section of Statutes which issued from the hands of the Committee shows that the Treasurer's revision was accepted. The great changes which he made can best be appreciated by comparing the Statutes, as altered, with those previously in force.* The President and Council, in reporting to the Fellows the completion of the revision, naturally remained modestly silent as to the Treasurer's share in the work. But his volume, with its crowded corrections and additions in ink and pencil, will remain as an interesting example of the thoroughness of all that he did for the Society.

The boldest step ever taken by the Royal Society was probably its acceptance of the control of the National Physical Laboratory. The urgent need of the establishment of an institution for physical testing and standardisation, in a great industrial and manufacturing country like Britain, had been strongly advocated by Fellows of the Society, more especially by Lord Rayleigh, and eventually the President and Council resolved to take charge of the efforts to create and maintain such a laboratory. A favourable site and a commodious house at Bushey having been obtained from the Crown, the Treasury was induced to place a small grant on the Parliamentary Estimates, and a number

* See 'Record of the Royal Society,' 1912, pp. 131-158.

of generous subscriptions came from well-wishers throughout the country. It was provided that the control of the Laboratory should be placed in the hands of the President and Council of the Royal Society, and that its income and all other property should be vested in the Society. At the same time, the Society became responsible for any deficit that might occur in the annual income. A spacious laboratory and other buildings were erected, and by March, 1902, various departments were so far advanced that the institution could be formally opened by the Prince of Wales. This initial success of the undertaking was followed by a rapid growth, fresh departments being started year after year. The advance would have been even more marked had the available funds permitted. But the expenses of management sometimes exceeded the income. Hence, though the Laboratory has amply justified the anticipations of its founders, the financial questions arising out of its development were a constant source of solicitude to the President and Council, and more especially to the Treasurer, who from the beginning, as the original Treasurer of the National Physical Laboratory, took a keen interest in its success. Besides watching over the finance of the institution, he did notable service in obtaining subscriptions and otherwise increasing its revenue. The outbreak of the War, in 1914, augmented and complicated the financial difficulties. It was now becoming evident that the task of conducting such a large and costly national institution as the Laboratory had become, lay beyond the province of any scientific society, and ought properly to be undertaken by the State. This transference of control was at last effected in 1918. On April 1 of that year, the Royal Society, having initiated the National Physical Laboratory and fostered its development for sixteen years, had the proud satisfaction of handing over to a Government Department this active and continually growing institution, which had proved itself to be an important addition to the scientific resources of the country. Among those who took a large but unobtrusive share in its development, the name of Alfred Bray Kempe deserves to live in grateful remembrance.

As befitted a barrister, Kempe evidently loved the definiteness, precision, and even the redundancy of legal language; and, as he frequently had to draft a formal resolution in Council or Committee, he found many opportunities of showing his mastery of that style of composition. I remember one occasion on which he made use of this acquisition with much effect. The question under discussion in the Council was the serious cost of the investigations which the Society undertook at the request of the Government. This was naturally a matter wherein the Treasurer was specially concerned, inasmuch as the expenses of these investigations were defrayed out of the Society's income, and sometimes amounted to a considerable sum, while the uncertainty of their probable cost always raised a difficulty in the framing of the budget for each year. He accordingly drafted and read aloud the following statement:—

“Whereas the President and Council have frequently been requested by various Departments of the Government either to advise them upon, or, in

some cases, to undertake the supervision of, and in others, the entire responsibility for, various scientific investigations of national importance no provision has been made by Government to meet expenses to which the Society has necessarily been put in acceding to these requests."

It was amusing to hear the emphasis which, as he looked up from his manuscript, he laid on the preposition at the end of each clause. He succeeded in getting negotiations set on foot with the Government, which resulted in a satisfactory arrangement for the future. The Treasurer then prepared a new regulation, approved by the Treasury, whereby adequate provision was made

"for any expenditure which may be incurred by the Royal Society in undertaking, controlling, supervising, or advising upon matters which the President and Council may, at the request of the Government, undertake, control, supervise, or advise upon."

As he read to the Council this document, which recorded the end of all the troubles of the past, there was a twinkle of quiet satisfaction in his eyes as, with much firmness in his voice, he pronounced each of the four verbs which described the varied kind of work done by the Society for the Government. The very sound of the words seemed to be pleasant to his ears.

Probably at no time in its history had the Royal Society been in close relations with so many Departments of Government as during Kempe's Treasurership. There can be little doubt that his sagacity and clearness of judgment in these conferences were of great value in removing difficulties, and impressing on the official mind the nature and extent of the assistance which the Society could render. It was doubtless in acknowledgment of these services that, in 1912, the honour of Knighthood was conferred upon him. His legal distinction had already been recognised by the University of Durham, which, in 1908, conferred on him the honorary degree of D.C.L.

In the early years of last century when the growing interest in the progress of science was beginning to suggest the creation of independent societies for the prosecution of research in different branches of enquiry, the movement was looked upon with disfavour by some of the leaders of the Royal Society, unless the new organisations were placed under the wing of that Society. This subordination was vigorously resisted, and many such societies have since then been successfully founded, and have been of the greatest value in extending the cultivation of the sciences which they represent. Yet the Royal Society, with the hearty goodwill of these younger associations, retains its time-honoured prestige, and finds that its activities have grown more varied and pressing than ever. Its Treasurership is an office that naturally brings the holder into contact with the other younger scientific bodies, and affords many opportunities for the promotion of friendly intercourse with them. Never were these amenities more happily secured than during Sir Alfred Kempe's tenure of the post. It may be mentioned here that of one of the younger scientific coteries—the Royal Institution—he was

a member for half a century, serving five times on its Board of Management, and taking a keen personal interest in its welfare.

A feature that should not be omitted from this sketch of Kempe's life was his abounding love of mountain scenery, which for many years drove him to spend his holidays in Switzerland. The lure for him was not so much the joy of reaching almost inaccessible peaks (though he could wield his ice-axe and take his share of adventurous climbing), as the quiet enjoyment of the grandeur and beauty of the mountain-world, and the pleasure of being once more amidst the Alpine flora. In the gratification of this passion he must have visited the Alps between forty and fifty times. To the last he maintained his keen interest in the literature of mountaineering.

Allusion has already been made to Kempe's love of music. Gifted with a good counter-tenor voice, he early began to sing. Even at school he was a member of the St. Paul's School Choral Society, where he sang the treble parts and later the alto. At Cambridge, among his college friends and fellow students, he gained a musical reputation, and became librarian of the University Musical Society before he was widely known as a mathematician. He had a piano at his rooms, on which he no doubt played the accompaniment to his vocal practisings. One of his friends at the time thus described the relationship between the instrument and its owner:—

Mistress of humble tones and haughty,
Kempe calls me his piano-forte ;
He plays me when a problem fails,
And rises lighter from the scales.

He sang in the Bach Choir under Otto Goldschmidt, who retained a pleasant memory of his "beautiful counter-tenor." He was a member of the Moray Minstrels, a private men's choir of glee-singers, where the peculiar quality of his voice enabled him to sing the alto parts. From the weekly meetings, the rehearsals, and the concerts of this choir he was seldom absent until the association was dissolved in the summer of 1907. He likewise occasionally gave his aid to the Westminster Abbey Choir at the evening service.

From this sketch of his career it must be obvious that for at least the last twenty years of his life Kempe was practically carrying on two professions. The ecclesiastical work of the chancellorships of half-a-dozen dioceses, and ultimately the burden of the great diocese of London, together with his professional engagements as a barrister, would have sufficed, it might be supposed, to keep any man fully employed; but, in addition, he had the serious task of piloting the Royal Society through its financial undertakings, as well as taking an ample share in the conduct of its other general business. He never shrank, however, from the discharge of his many duties. Whether or not it was this accumulation of work that overtaxed his strength, his health broke down in 1917, while the War was still in full strain. He nevertheless maintained a brave fight against increasing weakness, until at last, in

the summer of 1919, he felt compelled to resign the Treasurership of the Royal Society; but he consented to retain his seat in the Council.

The intimation of the Treasurer's resignation filled the Royal Society with sorrow as of a personal bereavement and a sense of unlooked-for and almost irreparable loss. These feelings were well expressed by the President, Sir J. J. Thomson, in his Address to the Fellows on the following St. Andrew's Day:—

“It was,” he said, “with the greatest regret, almost with consternation, that the Council heard from Sir Alfred Kempe that the state of his health obliged him to resign the office of Treasurer, which he has held for 21 years. It is difficult to find words adequately to express our indebtedness to him. By his sagacity, his long experience of the affairs of the Society, and his legal knowledge, he has rendered invaluable services in our councils and in directing the policy of our Society. He carries with him on his retirement from the office which he has so long and worthily held the thanks and good wishes of every member of the Society.”

After his retirement from the Treasurership there appeared for a time the possibility that his life might be prolonged. But at last pneumonia supervened, and he quietly passed away on April 21, 1922. Sir Alfred Kempe was twice married: first in 1877 to a daughter of Sir William Bowman, Bart., M.D., F.R.S., who died in 1893; and secondly in 1897 to the elder daughter of his Honour Judge Meadows White, Q.C., who survives him. By the second marriage there are two sons and one daughter.

It is not easy to describe the personal charm which endeared Sir Alfred Kempe to all who came to know him. His modesty, urbanity and frankness were at once apparent; at the same time his sound sense, and the touch of humour or flash of wit with which he would often enliven a formal conversation, made him singularly attractive. The lasting affection of those who were privileged to enjoy his more intimate friendship was won by his combination of genial qualities, above all by the overflowing kindness of his nature. His humility of mind and antipathy to anything like self-advertisement read a continual lesson to the ambitious. Thoroughness in all that he undertook was one of his most characteristic virtues. Not less conspicuous was the friendly readiness with which he would put his wide knowledge and experience at the service of others. As scientific circles are not free from the irritability and combativeness that affect other coteries of men, Sir Alfred was again and again appealed to as the irresistible peace-maker. Amid all his various gifts of character there was the glow of his pure Christian soul, which, while never obtruding his religion, could not conceal its benign and dominant influence in his life.

ARCHIBALD GEIKIE.
