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Obituaries

GEORGE CUNLIFFE McVITTIE (1904–1988)

George McVittie (often Mac to his many friends) was born on 1904 June 5 at Smyrna (now Izmir) in Turkey and died on 1988 March 8 in Canterbury, England. He was elected a Fellow of the Society in 1933 and served as a Member of the Council during 1942–6. He was a regular attender at Society meetings and was a kind, fair but firm Chairman. He was elected a Fellow of the Royal Society of Edinburgh in 1943.

As well as making distinguished contributions to astronomy and meteorology, he was active in their national and international organizations. He was at various times Treasurer of the Royal Meteorological Society, Secretary of the American Astronomical Society and, successively, Secretary, Vice-President and then President of Commission 28 (Galaxies) of the International Astronomical Union. He twice held a John Simon Guggenheim Memorial Fellowship (1962 and 1970), was Morrison lecturer at Lick Observatory (1956) and held the 'Chaire Georges Lemaître' at the University of Louvain in the Autumn of 1974.

His father was in business in Turkey when Mac was born (his father avoided internment during the First World War because he voluntarily ran the local fire brigade), and it is interesting to realize that the local community in Smyrna around 1900 had a strong Greek influence and included, among others, Aristotle Onassis (later the shipowner), Alec (later Sir Alec) Issigonis (the designer) and Jason Nassau (later Director of the Warner and Swasey Observatory). His younger brother had a diplomatic career and eventually became British Ambassador to Dominica. Such was the community that Mac knew as a boy and a young man. Mac, his brother and his sister never attended school but instead had governesses and tutors. He later wrote that he owed his pre-university education in very large measure to the Reverend Lucius Fry, who, during the years 1920–2, covered the whole of the normal secondary education. The McVittie family happily was on holiday in England in the summer of 1922 when the Turks sacked Smyrna and they never returned to Turkey.

In that year Mac had the intention of entering the University of Edinburgh to read Civil Engineering but instead joined his father and others in organizing relief for the refugees in Turkey, through the Imperial War Relief Fund. Later, Mac did indeed enter the University but to read Mathematics and Natural Philosophy (Physics) instead of Engineering, obtaining an M.A. with 1st Class Honours in 1927. He then began research in Edinburgh on astronomy, a subject that had interested him since his earliest days. He said that this interest probably began as a boy when he looked at the crystal-clear Turkish sky after dinner and was made firm when, in 1919, his father gave him a 3-inch telescope to view the jewel-like stars. His father also gave him a semi-popular account of relativity which Mac found confusing and, as he

later wrote, 'close to being non-sensical'. Be that as it may, he was not put off and relativity became his central interest. His time in Edinburgh was very happy and he spoke with warmth of the influence on him of Sir Edmund Whittaker, Sir Charles Darwin and N. Kemp Smith. This warmth was contrasted when, in 1928, he moved to Cambridge to work with Sir Arthur Eddington, a more austere and distant person. He now received his only formal instruction in astronomy. His research involved unified field theories and, although Mac never really warmed to them, he received his Ph.D. in 1930.

From then on his career developed in various universities. First (1930–33) he was a lecturer at the University of Leeds. Here he met and married Mildred Strong (the daughter of the Professor of Education there) and so began a long and happy married life which ultimately ended in 1985 when she died. From Leeds, the McVitties moved to Edinburgh (1933–4), where he was lecturer, Liverpool (1934–6) and then (1936–48) to King's College, University of London, where Mac was appointed to a Readership.

As for other people, so for Mac, the Second World War interrupted academic work. He moved to the intelligence-gathering Centre at Bletchley Park, where he was sole founder and Head of the Meteorological Centre. This work is still covered by the Official Secrets Act as to its details but he was generally concerned with obtaining continuous information about weather conditions over enemy-held territory through broken cipher codes of enemy weather forecasts. This work was of the greatest importance to our war effort. It contributed to making substantial cuts in aircrew losses suffered by Bomber Command at a crucial period of the night bombing offensive and this was a vital contribution. But much more than this – it proved possible to identify the location of field sources providing information to the enemy meteorological centre and this, apart from other information, led to the unexpected location of enemy submarines at sea. This was of the greatest significance and was instrumental in achieving a 75 per cent reduction in allied shipping losses in the Atlantic during 1942–3 when the Battle of the Atlantic was moving so badly for us. The recognition of this work at Bletchley Park was seen by the expansion of Mac's group to some 60 people; in 1946 he was made an Officer to the Order of the British Empire (O.B.E.).

Mac returned to King's College to pick up his academic work again and, in 1948, was elected Professor and Head of the Department of Mathematics at Queen Mary College, London. He was there for four years and during this time laid the foundations upon which the present highly successful Department has developed. His name is now attached to a Visiting Professorship at the College to commemorate his important contribution in those years.

In 1952 the University of Illinois was seeking a Chairman for its, then very small, Department of Astronomy and Shapley was asked his advice on filling the post. The job was offered to McVittie (an inspired if unexpected choice) and he left Queen Mary College for Illinois. It would have been possible for Mac to attend to astronomical matters in a relaxed way but this was not his style. From so small a beginning he built the Department up into one of the more significant teaching and research departments in the United States. All

the staff appointments that he made there were either observers or instrument makers and builders. Among the projects he promoted was an early radio telescope, a 600 × 400-ft parabolic cylinder, and a modern 40-inch optical telescope. His efforts were much helped by the launching of Sputnik by the Russians in 1957; observations of it were made at Illinois on what his wife later described as 'an enormous lavatory roll'. Apart from his Department, Mac lectured to local societies and joined several clubs. He had the reputation of a British eccentric, especially as he never drove an automobile (or, indeed, a motor car). He never lost his fine Scottish accent (how this was acquired is not clear because he lived in Scotland for so short a time and his parents were not Scottish). Illinois remembers him by having named a Chair after him.

In 1970 McVittie decided the time had come for him to relinquish the Headship of his Department and he took sabbatical leave to the University of Kent at Canterbury. This led to his retirement there in 1972, where he was made an Honorary Professor as part of a scheme for leavening young staff with senior academics. This was a most happy time for Mac and his wife, and fruitful for the University. He lectured and examined in astronomy and pursued research in relativity right up to the onset of his fatal illness at the end of 1987.

Mac's 80th birthday in 1984 was marked by a symposium held at Kent in his honour and the proceedings were recorded in this journal in 1985, volume 26, no. 2, June. He also had the unusual distinction that year of having a minor planet (formerly number 2417) named after him. Unfortunately his wife was by then unwell and Mac nursed her tirelessly until her death a year later. He commented at the time that worry was a marvellously effective diet for losing weight, although he had always been slight though tall.

Although he was by then clearly frail, Mac continued regularly to attend Society Meetings and question speakers, particularly on cosmology ('Do you really believe all that?' he enquired incredulously of one speaker on a cosmological topic). He was also himself active in research in relativity. He frequently attended the London relativity seminars, and as late as the summer of 1987 I recall him hastening away from one of the seminars in order to mark examination scripts for his astronomy course.

Mac was interested in archaeology for much of his life and played an active part in the Canterbury archaeological Trust, of which he was Treasurer from its foundation in 1976. It is interesting that Mac's maternal grandfather, George Weber from Alsace, was a recognized authority on the archaeology of the Smyrna region, a fact Mac was apparently unaware of until after his own interest in archaeology was well established.

Mac had several parallel research interests which he pursued throughout his life. His work on unified field theories started with his Ph.D. thesis and later, despite the sceptical attitude thence bred towards unified theories, he worked on Milne's kinematic relativity and described his work in several papers. The last technical discussion I had with him, in 1987, concerned the Lagrangian and field equations of a theory being developed by Chisholm and Farwell.

The second theme was the study of spherically symmetric solutions of the equations of general relativity. His first paper, in 1933, was aimed at

investigating whether condensations were affected by the overall expansion of the universe. (It is still an interesting model of lumps in the universe.) Interest in such work revived with the discoveries of the 1960s and Mac worked on collapse, expansion and oscillation of self-gravitating spheres. His 1984 paper gave a comprehensive list of analytically solvable shearfree perfect fluid configurations, and identified their recurrences in the extensive literature: this would have been a *tour de force* even by a much younger man.

Perhaps his most influential astronomical research (especially through his 1956 book *General Relativity and Cosmology*, which has remained a classic of clear exposition, though inevitably now dated) was on the derivation of predictions from model universes and their comparison with the observations. These range from investigations of the theoretical magnitude–redshift and number–redshift relations to statistical tests of departures from linearity of the Hubble law.

In his 1937 book *Cosmological Theory* he gave the definition of a 'radius of the visible universe' which was what was later called (by Rindler) the particle horizon. In the 1930s and again in the 1950s he worked on the question of definitions of cosmological distance originally posed in the context of Milne's theory, and showed that Hubble's methods implied the use of two distinct definitions. Later he studied the radio-source counts and was one of the first to realize the need for evolution of the sources, and their consequent uselessness as a selector between models of different densities. In 1961–2 he introduced the definition of the density parameter used in many subsequent writings. All this was complemented by a number of papers on particular models of the Universe.

A further, fourth, important theme was his work on hydrodynamics and gas dynamics, an interest that began with his meteorological work during the War. This was based on the then novel approach of treating the Newtonian theory as a limit of the relativistic theory and was particularly important in the study of self-gravitating gas clouds.

Mac's presence at astronomers' and relativists' meetings is sorely missed, as is his common sense (not so common after all), his wit and his sense of humour (perhaps best described by the word he was fond of applying to others: sardonic). It has been commented by a colleague, Professor Roy Chisholm, who knew him well, that Mac only deviated from his habitual gentlemanly behaviour when he encountered presumptuous pomposity. I know from personal experience that his sometimes acerbic and intimidating manner concealed considerable kindness and generosity. Speakers at Meetings will no longer have to face what became known as the McVittie question, which took some form such as 'Can the speaker tell a plain-minded astronomer what is the physical meaning of this work?' His apparent naïvety belied his very deep adherence to the primacy of observation. In a book, Stamatia Mavrides called him an 'empiriciste irréducible' (uncompromising empiricist). He was a man of great qualities and the Society is honoured that he was a Fellow.

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