Joseph Mark Gani
15 December 1924 to 12 April 2016

Joe Gani — for that is how he was known — was a founding member of the Australian Mathematical Society (AustMS) at its birth in August 1956. This was midway through his seven years (1953–1960) as a lecturer in Larry Blakers' Department of Mathematics at the University of Western Australia, though during the first four years he was a Ph.D. student at ANU for two years and a Nuffield Fellowship holder at the University of Manchester for another year. Significantly, during the formative years (1957–1959) of the AustMS (and the *Journal* started in 1962), he was mainly back at UWA, for Joe's major *international* mark lay in founding the Applied Probability (AP) Trust and starting its publications, the *Journal of AP*, *Advances in AP*, the *Mathematical Gazette* and finally *The Mathematical Scientist.*

Joe also made his mark as an administrator in university mathematical environments and, most significantly and for Australia, as Chief of the Division of Mathematics and Statistics, CSIRO. In his time there (1974–1981), he more than fulfilled his brief that it become more broadly involved in both research and applications of mathematics and statistics that can arise in supporting the wide range of scientific endeavours of that Organization.

Joe was elected a Fellow of the Australian Academy of Science in 1976, and was President of the Australian Mathematical Society 1978–1980. Many other societies and publishing endeavours with which he was associated are noted in Chris Heyde's (1988) tribute in the 1988 Festschrift.

Joe was born in Cairo, Egypt to parents who were children to emigrés there, arriving around 1891 from north-western Greece (from Ioannina on his father's side, and from the island of Corfu on his mother's). He first spoke both Italian (his mother's tongue) and French (his father's tongue); his first schooling was in French at junior primary school. The Great Depression caused his merchant father in 1931 to take the family to Japan where he attended a Canadian Academy school and learnt English. Back in Egypt in 1938 he completed his secondary education at

the English School in Cairo in 1941. Thereafter he enrolled in evening classes with the British Council, passing the first year's external Intermediate Examination of the University of London in engineering, and then the following year took the same level examinations but in science with an emphasis on mathematics. In the meantime his school gave him his first employment as a student teacher in 1942, and then a full teacher well before and until the war's end.

Joe left Cairo in August 1945, sailing to England on a troopship; he was headed for study at Imperial College London where his place had been secured by his headmaster Douglas Whiting, a Canadian, whom Joe would later visit in Ottawa on several round-world trips into the 1990s. Joe was more than successful as a student at IC: he graduated with First Class Honours, and moreover was awarded the Sherbrooke Prize for the first-ranked mathematics graduate of his year in June 1947. In the next twelve months he continued his studies under George Barnard, also doing some tutoring of mathematics students, eventually obtaining the IC Diploma in Mathematical Statistics.

Towards the end of this period war had broken out in the Middle East, in May 1948, and his mother became frantic that she and Joe's two younger brothers should flee Egypt where anti-Jewish feeling was running high. So it was that the family was united in England, albeit as stateless refugees, but there they were able to make application to several English-speaking countries as emigrants. Australia was the first country to offer them visas (their applications had been supported by Grace Drummond who had taught with Joe at the school in Cairo). Through Hyman Levy of Imperial College, Joe was recommended to Professor Tom Cherry at Melbourne University as a lecturer, and the Ganis' course for Australia was set. Joe flew ahead of his family who arrived into a house in Moorabbin that Joe had bought while they travelled by ship and stopped over in Perth with Grace Drummond. The Laby family were instrumental in helping Joe and family settle in Melbourne. Joe maintained contact with the Laby daughters Jean (cosmic ray physicist) and Betty (statistical consultant) till they died in the 2000s.

Cherry tried to stimulate Joe's interest in fluid mechanics but it did not appeal. Yet research enquiry certainly was part of Joe's make-up: he had certainly enjoyed his extra year's study at Imperial College with George Barnard. His three years at Melbourne University mainly teaching Applied Mathematics were marked by his reading broadly and, having contact with Maurice Belz, Geoff Watson and Evan Williams, deciding that his interests lay much more in probability and statistics than classical applied mathematics. Seeing his younger brothers and mother, in employment, were all settled, he resolved to return to London at the end of 1950.

Back in England and after some tutoring in London Joe was eventually recommended for a position at Birkbeck College. Joe had two brushes with officialdom in this period. First he applied to the Egyptian consular office for renewal of his passport, whereupon the Consular office retained the document, telling him that he should return to Cairo and make application there for its renewal. Second, while he had been recommended for appointment to Birkbeck College, this proposal was subjugated to a 'native' English person who was deemed preferable to emigré Joe.

Technically, he could have been deported but he still had his visa for entry to Australia and made use of it in good time.

Arriving back in Melbourne, Joe applied for a variety of (university) positions, but was not successful, seemingly because of his tendency to speak his mind on social issues: this had been acceptable in UK in the later 40s but in Australia by the early 50s it could lead to difficulties. Fortunately Joe was able to speak to Cherry, his chief referee for positions, and he was ultimately offered three positions of which he accepted a lectureship at University of Western Australia. This choice was fortuitous because Larry Blakers there was a broadminded academic supervisor. Within a year, Joe the ambitious young academic was granted leave by Blakers to study for two years at ANU under Pat Moran, and then a further year to work under Maurice Bartlett at Manchester.

While Joe's undergraduate training was in applied mathematics and statistics, his research training at ANU is best summarized as the British method of nurturing curiosity via serendipitous response to reading the literature or to one's supervisor sketching an 'interesting' problem. As he wrote c. 1988, "it took me a long time to comprehend that the pages of mathematical reasoning in research papers did not spring complete from one's mind, that the process of research [on problems] consists of asking a question, and then moving gradually to its answer, and that what counted most was the idea motivating the question." The majority of Joe's first dozen publications concerned storage theory (= dam theory) and Markov chains, whether as sole author or jointly with Moran or (later) Uma Prabhu; much of this work is included in Moran's (1959) monograph.

In his second year as a Ph.D. student at ANU, Joe met Ruth Stephens, a botanist from UK working with Otto Fraenkel in the CSIRO Division of Plant Industry. Theirs was a relatively short courtship, leading eventually to the birth of four children in diverse places to which Joe's academic life took them both: Jonathan (born in Perth) and now a surgeon in Newcastle; Miriam (New York) an Associate Professor in Law at ANU; Matthew (Canberra) a biomedical engineer in Seattle; and Sarah (East Lansing) a General Practitioner and medical educator in Sydney. Ruth interested Joe in sundry biological problems on which he wrote a multitude of papers describing simple mathematical models for the related phenomena. She subsequently started study for a Ph.D. at Kentucky State University but settled for an M.Sc. when Joe moved to Santa Barbara in 1985. Then in the 90s as Joe started to reduce his travels Ruth took ill with cancer; she lived in remission for three years till her death in 1997. Forever after Joe felt their lives together were cheated around the very time that he confined his travelling to Australasia.

While at the University of Western Australia and with encouragement from Blakers, Joe became interested in documenting the state of mathematics and statistics at Australian universities. It was evidence of his concern for others and the society in which he lived. Joe's activities when back in Perth after his Ph.D. studies and work in Manchester were duly noted by Moran who invited him to return to the ANU in 1960 to a more senior position. Joe ran successful Summer Research Institutes in Canberra, gathering together like-minded researchers who studied questions in a range of probability modelling areas that included interests

of Moran and Ewens in genetics. Ted Hannan, who came to ANU as a Ph.D. student around the same time as Joe in 1954, had stayed there. All these researchers who sought publication outlets for their work in the established journals of the day, usually successfully but not without some difficulty, were ultimately egged on by Joe with support in principle from Hannan, Moran and others, to have their own journal of applied probability. The major impediment in furthering such an enterprise from an Australian base was the lack of a publisher. While Joe and colleagues had raised half the necessary funds privately, it ultimately took a trip to England, the offices of David Kendall and a visit to the London Mathematical Society, to establish a framework that resulted in Volume 1 of *Journal of Applied Probability* in June 1964. Its first Editorial Board reads as a list of Who was Who in Applied Probability at the time, reflective of Joe's breadth of contacts.

By then Joe had become frustrated with Canberra as a base, and USA beckoned (after all, Blakers' early experiences that influenced the environment at Perth had been in USA rather than UK where Joe started his academic life and which was the dominant Australian influence until the 60s or 70s). So while he headed to Michigan State University at East Lansing in 1964, he stayed there only eighteen months before the University of Sheffield, doubtless with encouragement from elsewhere in UK, was successful in enticing Joe to establish a Department of Statistics and Applied Probability. While he was subsequently involved in founding university departments at Lexington (University of Kentucky) and Santa Barbara (University of California), it is the Sheffield institution that has lasted longest as a group whose growth Joe guided.

While in Sheffield Joe established an office for the publication of the *Journal of Applied Probability* that continues to this day. He was always aware of his surroundings, and for this reason he assisted Manchester University nearby when within a couple of years the Statistics discipline there needed bolstering following the departure of Peter Whittle for Cambridge. This help involved a significant Australasian component — Chris Heyde, David Vere-Jones, Jim Pitman, Niels Becker, Terry Speed, Sue Wilson, David Scott, Ishwar Basawa and Malcolm Clark, were part of a joint Manchester–Sheffield endeavour. On broader fields he was one of the UK's Statistics Professors who would dine together informally after read papers of the Research Section of the Royal Statistical Society in London, and he instigated a Newsletter for European Meetings of Statisticians.

In 1973 following the death of Cornish as head of the CSIRO Division of Mathematical Statistics (DMS) a year before his anticipated retirement, the CSIRO Executive ultimately invited Joe to review the whole DMS operation. His 32-page report to the Executive provided a blue-print for redirecting the Division which he saw as being focussed on work that was 'subservient to customer demand, ... not ordered on the basis of well-defined scientific priorities' (Speed, 1988). Joe was eventually persuaded to leave Sheffield in 1974 and implement his recommendations. These included replacing DMS by a Division of Mathematics and Statistics that would provide a much wider range of mathematical research and consulting services in an expanded Division. The Executive supported Joe: the period 1974–1981 marked a diversification of the Division in both deed and name, no longer concentrating on agricultural statistics and undertaking much

more of its own research. With its new recruits, its international standing grew through both an active visitor programme and much increased publication that was fostered.

Seven years later the CSIRO Division that Joe headed was reviewed in praiseworthy terms that noted his significant achievements, at the same time recommending that it move away from its emphasis on research so as to embrace work of a more commercial nature. Joe was not opposed to the principle of such a direction, but he could not agree to overseeing the running down of a successful research enterprise, so he found full-time employment elsewhere: first for four years at the Kentucky State University in Lexington, and then a little longer at the University of California at Santa Barbara (and more years part-time, commuting each year for a quarter from his retirement base in Canberra onwards from 1991).

What can be said of Joe's research and written work? He was forever curious to discover how mathematical approaches to social and biological phenomena might increase our understanding of them, whether by deeper modelling assumptions or simple superficial descriptions. His mathematical writing reflected his belief that mathematical methods should enable us the better to understand scientific phenomena. He understood that the art of writing requires constant practice, and lived up to this until his last year (much of his writing onwards from 2005 was with Randy Swift, a student and colleague from Santa Barbara and Kentucky). He was an inveterate collaborator, responding quickly to any written suggestions or edited versions from his collaborators. As a journal editor he was equally quick, and endeavoured, whenever a manuscript was not acceptable for publication, to make some positive suggestions to the author as to what lines of enquiry might lead to improvements.

Joe's bibliography lists some 15 books (6 are festschrifts, 2 are biographical concerning applied probability, another on *The Condition of Science in Australian Universities – A Statistical Survey 1939–1960*), some 351 papers (the majority mathematical research but including 30 obituaries and c. 25 reports or news items), and 104 Book Reviews (1961–2008). A partial list of these items is included in Seneta (2017), including all his publications on epidemics. He wrote a variety of expository articles for both *Mathematical Spectrum* and *The Mathematical Scientist*. As an editor he was meticulous in attention to clear expression and first class use of language, whether English or French. In accepting material for publication he would often attend to some of the copy-editing. As a co-author he would polish language and accept his own writing being polished as well: in short he was a splendid collaborator with whom to work.

Much was said in eulogies at memorial occasions in Canberra in April at University House soon after Joe's death and at the Statistical Society of Australia meeting in December about his sociability through shared coffee. Any occasion when he might gather colleagues informally was part of his hospitality, the better to promote the communal spirit of those about him. In this he recognised that from the smaller actions of pastoral care there may grow broader connections built on the diverse interests of those individuals involved. His annual pre-Christmas parties in Canberra, at University House or the Academy of Science, involved his

brother Robert from Melbourne, his children and grand-children and partners, and a few closer friends from his Canberra circle (and this was a large number); such highlights reflected Joe's convivial nature. His weekly routine in 'retirement' included late Wednesday afternoon sherry-time or Saturday visits with those who were less mobile, often followed on Saturday afternoon at the cinema.

Joe lived his life well and to its fullest extent. He was proud of his adopted country which in turn honoured him as a Member of the Order of Australia (AM) in 2000, and awarded him a Centenary Medal in 2001.

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