

Geoffrey Lyman (1948–2023)

By Kim H. Esbensen

DOI: 10.62178/sst.001.009

We are deeply saddened to share the news of the passing of Geoff Lyman, a distinguished alumnus of McGill University and a stalwart of the Julius Kruttschnitt Mineral Research Centre (JKMRC) coal flotation team. Geoff's unparalleled contributions to the field of Chemical Engineering and his extensive research over three decades at the Centre have left an indelible mark. Geoff was known for his exceptional ability to tackle new problems and devise innovative solutions. He designed and built the first coarse coal ash analyser, later commercialised as COALSCAN, setting a significant milestone in the industry. His research encompassed a broad range of topics, including coal dense medium cyclones, control systems for commercial coal jigs, turbulence effects in coal flotation, application of geostatistics for coal washability analysis, dynamic simulation of process flowsheets, modelling of mineral textures, and the development of sampling techniques and associated analysis. After his tenure at UQ, Geoff leveraged his expertise to establish a successful consulting business, continuing to contribute significantly to the field. Geoff, known for his perfectionism and his hearty laugh that resonated across the Centre, will be profoundly missed. Our deepest condolences go out to Geoff's family, friends, and colleagues. His legacy will continue to inspire and guide the mineral processing scientific society in its future endeavours.

 **Mohsen Yahyaei** Director, University of Queensland

Terribly saddened to hear the news! I was fortunate to have Geoff as one of my doctoral thesis supervisors at the JKMRC. He was a very knowledgeable man and was always willing to share his wealth of wisdom. I have learned a lot from Geoff. I still fondly remember the many conversations we've had over the years. He had a great sense of humour and a very hearty laugh! Always had an anecdote or joke up his sleeve to lighten the mood. His passion for mathematics and for sampling were second to none. A great loss for the scientific community indeed. May Geoff's soul rest in peace.

 **Vijay Subramanian**



Fig. 1: Geoffrey John Lyman
* 28 June 1948
† 28 September 2023

Thank you for sharing this sad news Mohsen. I remember very clearly passionate discussions with Geoff on the art, science, statistics and mathematics of sampling. My condolences to all who were close to Geoff.

 **Mark Noppé**

RIP Geoff, you'll be dearly missed, scientifically and personally...

 **Florent Bourgeois**

Very sad news. As a student at the JKMRC in the 1980s, the “Lyman Radius” was well recognized as the perimeter needed to fall outside of earshot of his booming laughter. Long will I remember Geoff for his ability to laugh wholeheartedly. He is someone you cannot readily forget, nor should you...RIP.

 **Adrian Dance**

Thanks for the update. I had Geoff as a supervisor. The first half year we had a pretty hostile relationship (I guess two strong alpha males). But once we settled down we had a great relationship. He certainly was an interesting character and very passionate. He was not well understood by others – and I ended up finding myself in agreement with him far more often than not. He had many funny stories. One of my favourites was him talking about his Masters. He finally finished his Masters and decided to submit and then said to himself ,nah’ and wrote the whole thing again from scratch. A year later he was now very pleased with the new version, but then said ,nah’ and did it again. Finally he submitted. He was a perfectionist way off the scale. Both my supervisors: Bill Whiten and Geoff Lyman have now passed away – and the world is a much less lively place.

 **Stephen Rayward**

Indeed this is very sad news and I’m lost for words in responding to Geoff’s passing. He was incredibly smart as many of us who met Geoff would know, but he was equally brilliant as a chef and host. So whether you needed a Lagrangian solution to your least squares mass balance or a recipe to a Gruyère soufflé, Geoff was the person to see.

My sincere condolences go out to his dear family and friends, as he will be sorely missed. I was lucky to have known Geoff. May he rest in peace.

 **Toni Kojovic**

I can always remember Geoff telling me that we don’t teach engineers enough maths and statistics – as part of a sampling course he taught for Trail Operations. I really respected his work in this field and then actually going and getting stuff made that lived up to his high standards. What a great loss – to the industry and his family and friends. RIP Geoff.


 **Rob Stephens**

I was saddened to hear of Geoff’s passing. Whist I did not know him well, we had met at various WCSB and Sampling Conferences in Australia and elsewhere. His knowledge and enthusiasm for sampling science were without bounds, along with his mathematical treatments! It was fitting that his two last papers were published in the journal *Minerals* around the time of his passing. Even to the last, his writing resulted in much robust discussion by the reviewers. His book published in 2019, will be a lasting testament to his achievements in the field of sampling. RIP Dr Geoff Lyman.

 **Simon C. Dominy**

VALE GEOFF LYMAN

I was deeply saddened to hear of the passing of Dr Geoff Lyman, a leading authority and creative thinker on the theory of sampling, quality control and quality assurance. After completing his Bachelor and Master of Engineering studies at McGill University in Canada, Geoff moved to the University of Queensland (UQ) where he completed a PhD in Mineral Processing Control and Instrumentation. He subsequently spent more than 33 years at UQ’s Julius Kruttschnitt Mineral Research Centre (JKMRC) carrying out research in coal and minerals processing, including coal washing, flotation control, on-line analysis, dense medium cyclone circuit design and jigs. This kindled his life-long interest in the impact of material heterogeneity on all aspects of mineral sampling and analysis. In 2000 Geoff branched out and set up his own consulting company, Materials Sampling & Consulting Pty Ltd based in Southport, Queensland, where he spent the rest of his life. Geoff’s work has been spread across an impressive range of industries, including precious metals, diamonds, coal, iron ore, base metals, catalysts, grain and meat. Major achievements include development of the first on-line coarse coal ash analyser and more recently publication of a new textbook on sampling. In recognition of his standing in the sampling community, Geoff was awarded the prestigious Pierre Gy Sampling Gold Medal at the 9th World Conference on Sampling and Blending held in Beijing, China, in 2019. Geoff was also a foundation member of the Advisory Group of the International Pierre Gy Sampling Association (IPGSA) since its inception. My condolences go out to Geoff’s family, friends and colleagues. He will be sadly missed. Rest in Peace

 **Ralph Holmes, President, International Pierre Gy Sampling Association**

I met Geoff Lyman for the first time at a sampling course I was presenting in New Castle Australia for the Australian Minerals Foundation. I was fascinated by Geoff's intellect when he was writing many equations on a napkin when taking breakfast and dinner together. Then we met Geoff again many times at the WCSB conferences, and other conferences as well. Geoff was an excellent cook and had a passion for sophisticated French Cuisine. At each conference he would select the best French restaurant in the visited region. Then we, I and my late wife Deloris, would join him at that restaurant and would share good food, outstanding wine, and good laughter.

Geoff had a superior intellect, and his dream was to simplify everything with advanced mathematics. Such simplifications did not always work too well with many people. Nevertheless, his suggestions were deep, often pertinent, and most certainly worthwhile careful considerations. His last book "Theory and Practice of Particulate Sampling, an Engineering Approach" was a brilliant achievement and I had the great pleasure to review the book several times prior to its publication. Doing that work for my good friend, I often struggled with the so-called "mathematical simplifications". Geoff was a good man. He was a perfectionist in everything he did. If you find something you can do with passion, you don't need to work anymore, as work becomes an immense pleasure. He definitely radiated that way of living, that way of thinking, and that way of loving. What a great man!

 **Francis F. Pitard**

Geoff's passing was very sad news. He made a significant impact on our work by helping us to obtain much-needed equipment and practices to help with our sampling processes. Personally, he answered all of my questions with fervor and respect (even the really basic ones) and helped me reach a much better understanding of the broad areas of Sampling Theory as well as the operational aspects of proper sampling. He had a very healthy skeptical view of the "establishment" while holding great respect and energy for the topic of sampling. I can't think of any other colleague that would be excited to climb up over 20 m on a metal ladder at -300C in the middle of February on the wind-swept Canadian Prairies in order to view a sampler in action; Geoff did it with a (frozen) smile on his face, in a borrowed jacket and mitts, right after arriving from summer in Australia. He will be missed.

 **Sheryl Tittlemier**

I knew and interacted with Geoff Lyman exclusively through the IPGSA community, in particular through nearly all WCSB's since WCSB2, Brisbane (2005). Geoff showed great interest in presenting his life-long work of further development of the Theory of Sampling (TOS), which he regarded only as a starting point. At a series of conferences, he presented increasingly more fully developed aspects of his view of what a theory of sampling *should* be: from a strict Poisson distribution point of departure, he developed a heavy mathematical-statistical avenue towards deriving 'the full sampling distribution' (Lyman) - as opposed to 'merely the moments' hereof (Pierre Gy). In his command of the necessary mathematics and statistics he was quite simply *brilliant*, as witnessed by what was to be the culmination and the academic pinnacle of his work as three seminal publications: a monumental textbook, and two high-level papers published in the prestigious journal MINERALS just before he passed away. Serving in various roles within the world sampling community, I had occasion to interact with Geoff as editor of the Proceedings from many WCSB conferences. It was not easy being an editor when a paper from his hand appeared on your desk. He would have no reviewer criticism of his work "if it did not include what I should write instead". Also, on many occasions I came to well-nigh desperation when (first) he flatly refused invitations, (then) *ditto* stronger exhortations, and lastly threats of rejection - if he did not at least *tried* to describe in more clear text what his hallmark dense mathematical derivations actually meant physically etc. This was also the case regarding his two last papers in MINERALS, for which at one time no less than seven reviewers were involved causing quite some academic gun smoke. Still, this is but the academic way, an important part of how science progresses. In the end, at the next physical encounter(s), we usually all met friendly enough in the bar and downed quite a few ... although with Geoff it was distinctly better calling up good wine and food. From the realm of the IPGSA, a personal highpoint for him was receiving the prestigious Pierre Gy Sampling Gold Medal, Beijing, May 2019, the highest recognition for sampling science and education.

Geoff Lyman, close to the most brilliant of us, and certainly the brashiest - we will miss you thoroughly.

 **Kim H. Esbensen**



Fig. 2: *The Pierre Gy Sampling Medal being awarded to a proud Dr. Geoff Lyman in 2019. Photo used with permission by WCSB9 committee.*

Geoff is gone. Just like that. How sad. It was fun to have him around. He may have disliked the French, but he did love at least their food and could show it emphatically! And what a loss to our sampling community: he was always producing interesting material and ideas, with his mathematical derivations at which he excelled so much, to the point he sometimes missed the forest for the tree. He had indeed put his finger on a potentially important point in his latest publications that may one day prove decisive in advancing TOS models, but tragically, he did not realize it on time. We will follow suit and give him all the deserved credits when the time comes. Geoff also had a dream: modelling segregation in equations. This one will be much harder to follow on... Some things cannot be solved with maths. But we will try. We owe it to him. Adieu, Geoff!

“ Dominique Francois-Bongarcon

J'ai malheureusement rencontré Geoff trop tardivement pour profiter pleinement de ses connaissances très étendues et de ses idées de simplification et d'extension de la théorie de l'échantillonnage, qu'il avait le souci et le plaisir de transmettre. Malgré tout, les quelques discussions que nous avons pu avoir nous ont rapproché sur le plan scientifique, que ce soit dans les domaines de l'échantillonnage, du bilan matière ou de la libération minérale.

Sa bonne humeur et son franc-parler ne me font que regretter sa disparition bien trop prématurée et le fait de n'avoir pu développer une amitié au-delà d'une entente sur le plan des idées. Il m'avait fait l'honneur de revoir ses derniers articles avant publication et ce fut l'occasion de derniers échanges toujours aussi fructueux.

“ Stephane Brochot

Having sat in on many a WCSB conferences listening to many IPGSA members, honing my own layman's knowledge of sampling, I was never able to follow Jeff's presentations, but this is due more to my tuning out anything mathematical than Jeff's prowess on the topic. It was not until the conference in Beijing that I got to know the other side of Jeff, a more down to earth, relatable, and even funny Jeff. Several people have mentioned his love of French food and wine. It went further than that as he talked about his love of preparing dinner parties for large groups of friends at his home—there was no sign of the sampling genius in our conversations—just someone who enjoyed the social aspect of being with friends. I am glad I had the opportunity to see his softer side. I am sure he is indulging in a good bottle of wine and preparing a feast on the other side. After all he went through in his last year, he deserves to celebrate the life he had – Rest in peace Geoff.

“ Anne Jodon Cole

Editor's curated selection of Geoff Lyman's scientific and technological impact and achievements:

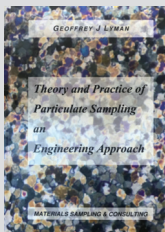
1. "Sampling Particulate Materials – Recent Advances"



Geoff Lyman, AusIMM NZ Branch & RSC

youtu.be/bNlJtJMj1pc

2. Geoffrey Lyman's pinnacle academic achievement, self-published textbook (2019):

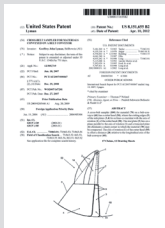


"Theory and Practice of Particulate Sampling an Engineering Approach"

Materials Sampling & Consulting, 2019

ISBN: 9781646333820

3. Brilliant attempt to resolve the decade long inferior cross-belt sampling enigma:



CROSS-BELT SAMPLER FOR MATERIALS CONVEYED ON A BELT CONVEYOR

United States Patent

Patent No.: US 8,151,655 B2

Date of Patent: Apr. 10, 2012

4. Latest two papers, published in MINERALS just two months before the Author's passing:



A Statistical Theory for Sampling of Particulate Materials

Minerals 2023, 13(7), 905; <https://doi.org/10.3390/min13070905>

Sampling Theory for Mineral Process Flows

Minerals 2023, 13(7), 922; <https://doi.org/10.3390/min13070922>