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SPECIAL COMMUNICATION

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Remembering Walter C. McCrone—Scientist, Mentor, Leader and Friend*

ABSTRACT: Walter C. McCrone (1916–2002) was a special person. While books, journals and ledgers record over 400 of his technical contributions, his true legacy is his inspiration and leadership. In remembering "Doc" McCrone, we honor a man dedicated to people, to science and to education. His passion for microscopy was only exceeded by his love of science, people and teaching. While he ranked microscopy as the first step in every scientific investigation he made use of all technologies in formulating and testing hypotheses. Everyone who met Walter has a story to tell of this man's impact on his or her life; I will tell you mine.

KEYWORDS: forensic science, Walter C. McCrone, chemical microscopy, scientists

On first meeting Dr. McCrone in June of 1958, he greeted me saying, "You're the one who singed up for all three courses this summer; I really wanted to meet you". The spark in his eye, the smile on his lips and the tone of his voice conveyed his honesty and sincerity. Imagine my feelings, a neophyte, and Dr. McCrone wanted to meet me. In the 45 years since then, Dr. McCrone inspired thousands of students with sincere interest in their learning microscopy combined with his special talent to teach. He encouraged the beginner with accolades for modest accomplishments and tested the more accomplish with stern critiques, puzzles and sharing his experience.

Dr. McCrone was blessed with special qualities that set him apart. If Walter were an entertainer, then he would be a superstar. We elevated and revered him because he had a special way of connecting with people. Walter's feelings for all people were broadcast by his words, his actions and his strength. His special insights were scientific, artistic and humanistic. He will always be a superstar.

His loyalty to Cornell University is legendary. He was a disciple of Professor Chamot and an evangelist for chemical microscopy. When the chemical microscopy program at Cornell was threatened with extinction, McCrone took action to secure its continuation. While many alumni give money to their universities, Walter did more; he worked with the university to rebuild the program. Surely, Chamot was an inspiring teacher, as the lives of his students bear testimony, but McCrone stands alone as his champion. During McCrone's life, he taught microscopy to more students than anyone else in history. Throughout his life, Walter was true to the teachings of his mentor and to Cornell University.

Two years before I began working with Dr. McCrone, he started Walter C. McCrone Associates. This company started with three scientists, (Donald G. Grabar, Lucy B. McCrone and Marvin A. Salzenstein), a few contracts and a dream. We all know that Walter's dream came true. Walter's first laboratory was equipped with a simple polarized light microscope, a Leitz micro IPSO 35-mm camera, a Kofler hot stage and a hot bench. He relied on his scientific knowledge, his leadership and his network of friends. Networking is a buzzword for today's entrepreneur, but Walt set the standard years before. He was a man of bold actions, dedicated to science and focused on the fundamentals of chemistry and chemical microscopy. Armed with his microscope and his intellect, he was prepared to attack any problem and defend his scientific principles.

When Walter asked, "Since you are so dumb that you singed up for all three courses, your are probably dumb enough to come work for me?", I had a job offer that could not be refused. While working with Walter, each day was an opportunity to learn more science, solve analytical problems and live life to its fullest. We had a common love in studying the world through the magnifying glass. Light microscopy was as simple as magnifying an ink-line on a paper or as complex as understanding the crossed axial plane dispersion of 1, 8-dinitronaphthalene. "John, take a look at this and tell me what you think"; the beginning of another McCrone tutorial.

I soon learned from Walter that to verify the results of microscopical analysis required more than simple observations and pretty pictures. A chemical microscopist was first and foremost a good scientist. However, understanding and using microcrystalline chemical tests, hot stage microscopy, density measurements, dispersion staining, X-ray diffraction, infrared spectroscopy, gas chromatography, and fluorescence were required to support chemical microscopy. As years went on this list of technologies grew and so did Walter C. McCrone Associates.

When fine particle analysis became a strategic interest, Walter eagerly proposed using transmission electron microscopy and X-ray microbeam analysis. But true to his basic beliefs, he argued that the collection and handling of fine particles was pivotal to getting meaningful data from these new technologies. His argument

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proved prophetic. His focus on basic principles should never be misunderstood, under rated, or trivialized.

Dr. McCrone was a scientist devoted to light microscopy. He believed strongly that observation is the primary tenant of the scientific method and the light microscope was the fundamental tool of science. Many read into his writings a reluctance to accept advances in instrumental analysis; this is wrong. His message was always to begin a scientific investigation with observation and use microscopy as the initial step. Ranking the light microscope as the first tool of scientific investigation does not diminish contributions by other technologies. Conversely, new technologies neither eliminate microscopy nor displace its primary position.

The exclusion of microscopy from the training of chemists was the problem that perplexed Dr. McCrone more than any other. Why is microscopy so ignored by most chemists? He protested, proselytized and took bold action to make certain chemical microscopy would not be lost. For more than forty years he taught a polarized light microscopy course at the Illinois Institute of Technology. He also initiated microscopy classes for young people through the State Microscopical Society of Illinois. In 1958, McCrone Associates began holding its own classes. That year Dr. McCrone taught three two-week classes, Chemical Microscopy, Fusion Methods and Optical Crystallography. There were just four students in the first class and only one signed up for the other two. The classroom was the living room of his three-bedroom apartment. Five years later, the McCrone Research Institute (MRI) was formed, separating teaching and other operations from the contract research business of McCrone Associates. MRI is now the undisputed leader in teaching chemical microscopy. He filled the void and kept chemical microscopy alive, but why chemists ignore microscopy remains unanswered.

Difficult and challenging problems need microscopy to set the course for their solution. That is the rational for microscopy being the cornerstone of forensic trace evidence examinations. The skilled microscopist can extrapolate from the shapes and forms to deduce history. To McCrone, a particle was more than a chemical substance, it had a history. Was it ground or precipitated? How was it ground? Does its size fit within the range of a known source? A summary of the McCrone approach is to attack every examination by first looking at samples using the microscope; but don't just look, document; don't just document, study; don't just study, think; don't just think, speculate; don't just speculate, test. I do not believe Walter ever thought of forensic science as a separate field, it was just one more application of solving difficult problems using the principles of chemical microscopy.

The mantra of the scientific method is observation, documentation, contemplation, speculation and verification, but to Walter this was his flow-chart for life. Dr. McCrone was dedicated to scientific principles, driven by his convictions and a tireless worker. Now the baton has passed, we must grasp it and continue the race. Dr. McCrone challenges us to keep the fundamentals of microscopy foremost in our minds.

Society was truly blessed by his life.

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