THE PAST-PRESIDENTS' MEDAL FOR 2004 TO FREDERICK J. WICKS

Fred Wicks is universally recognized as the world's leading expert on the serpentine minerals. His research has focused on this complex group of minerals since his Ph.D. work at Oxford in the late 1960s. That was a time when new advances in technology were promising great advances in our knowledge of the common rock-forming minerals, and the temptation to work on more tractable minerals than serpentine must have been great. However, the decision to tackle the crystal chemistry and the intriguing textural aspects of the serpentines showed both insight and courage. Fred pioneered the use of X-ray microdiffraction techniques in mineralogy, applying them to the study of the textural aspects of serpentine crystallization *in situ*. At the same time, he saw the importance of a complete understanding of the structure of these minerals to an adequate interpretation of their mechanisms of formation, and undertook a detailed re-appraisal of the structural aspects of the serpentines in cooperation with Eric Whittaker at Oxford. The result was a series of benchmark papers on the structure and textural paragenesis of the serpentines, papers that are still widely quoted today. For this work, he was awarded the Hawley Medal *twice*; this is the only work that we have doubly honored in this fashion, a measure of the impact that it had then, and still has today.

More recently, Fred has widened his serpentine interests to include detailed field studies in several of the classic areas of serpentine occurrences in Canada. In this work, he has explored the petrogenesis of serpentines and the serpentinization process. Of particular note in this work is the emphasis on the role of fluids, and the particular signature they leave on serpentinites in tectonically active areas. It seems that the serpentinites are a sensitive recorder of the fluid-circulation regime in the region, and may hold the key to a much more detailed analysis of fluid behavior in tectonic processes than has hitherto been the case. For this, he was awarded the Hawley Medal a *third* time for his work on the petrogenesis of serpentinites.

However, Fred's interests are not confined to the serpentine minerals. He has been deeply involved in the development of techniques of thermogravimetric and evolved gas analysis for minerals. The mineralogical application of these techniques has focused on two areas, the analysis of clay minerals and the characterization of new minerals. He is generally recognized as a leading expert in the application of TGA–EGA analysis to clay minerals, and has recently been involved in several short courses and symposia as a lecturer or keynote speaker in this area. Fred has also cooperated widely with many other investigators in the detailed characterization of new minerals, perhaps not glamorous work, but work that is providing baseline mineralogical information, and work in which his expertise in TGA–EGA is of particular importance. Fred has also a significant interest in gemstones, and has promoted the study of the Muzo emerald deposits in Colombia, using a wide variety of modern mineralogical techniques.

More recently, Fred has developed an interest in Atomic Force Microscopy, and together with Grant Henderson has been one of the very few people to develop atomic-resolution imaging of the surfaces of insulating minerals (*e.g*, silicates) by AFM.

Through his significant contributions to crystallography, mineralogy and petrology, Fred Wicks has achieved wide international recognition, as attested by his achievement as triple Hawley Medal winner. He is a most deserving candidate for the Past-Presidents' Medal of the Mineralogical Association of Canada.

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I am very pleased to be acknowledged by my peers and fellow researchers, and I thank the Mineralogical Association of Canada and the Past-Presidents for this honor. In my recent retirement, some people have said "What a nice way to go out, you get an important medal, now you can put your feet up." Yes I could, but I am not through yet. I am back to the position I have not been in for more than 30 years: no committees, no administration, just research. It is like being a graduate student again, but without the thesis defence. It could not be better.

My passion for geology began in a high school science class in Winnipeg. When I told my Mother of my excitement, she informed me she had been the first woman in geology at the University of Manitoba. I guess geology is in my genes. Another important factor developed from my part-time jobs. My Dad was a manager at Eatons and said "whatever you do, you have to learn to sell yourself and you might as well learn it selling in Eatons." It is true that selling is important, but I also learned I had to do something I enjoyed if I wanted to have a happy career. This brought me back to geology, it fascinated me, jobs were plentiful, and you worked outside, perfect. I enrolled in Honours geology at the University of Manitoba.

My interest in mineralogy was fired up by Bob Ferguson, who taught crystallography and mineralogy with a brilliant and effortless clarity. I realize later that he also instilled in me the concept that has guided my career. Mineralogy is at its best when it is applied to solving geological problems. The next important step was my introduction to serpentine minerals. I still vividly remember the lecture on serpentinization by Bruce Wilson in our petrology class. For some reason, this problem caught my imagination; although I did not see it at the time, a course had been set for me.

I worked for mining and oil companies during the summers, and learned how to operate in the field, but concluded that I did not want to be an exploration geologist. I went back to Manitoba to do a M.Sc., and learned another important lesson. I was approached by Rocky Russell, Manitoba's renegade professor, with a suggestion for a master's thesis: a study of the clays of glacial Lake Agassiz using the new thermoanalysis equipment he had bought with an NRC grant. I was excited because this was new, and it was not exploration geology. Rocky knew nothing about clays or thermoanalysis, so I taught myself with the help of Bob Ferguson. I discovered that I loved this way of learning, on my own, with my own problem, finding the solutions and help I needed.

I then learned another lesson in the Research lab of the Manitoba Department of Highways. I worked on Manitoba's famous gumbo clays, frost heaves and embankment failures, but I realized that I wanted to return to the mainstream of mineralogical research. The serpentine minerals appeared once again. Colin Coats, a Ph.D. student, asked me to do thermoanalysis on the Manitoba Nickel Belt serpentine minerals that he was having trouble characterizing. When Colin suggested I take his samples to use as the basis for my Ph.D. research, I realized I was hooked on serpentine.

The choice of where to study serpentine minerals in the 1960s was easy because the two world serpentine experts were in one place, Oxford. Jack Zussman was Reader in Mineralogy, and Eric Whittaker had just joined the staff. Once again I found the sort of supervision I loved. Jack said, "I have just bought this microbeam X-ray camera, and I think it will be great for looking at serpentine minerals *in situ* in thin sections. Off you go, come to me if you get stuck." This was great, no courses, no one looking over my shoulder; all I had to do was get on with it. Eventually Jack moved on to the Chair at Manchester, and I continued with Eric as my supervisor. I still remember the thrill when my ideas on the serpentine minerals began to come together, and how Eric, a quiet man, opened up during the discussions of the drafts of my thesis. What great times we had!

It was in Oxford I got the best medical advice one could hope for. I developed eye strain in the later stages of my microscope work, and eventually saw an eye doctor on Harley Street. He asked a lot of questions, very thoroughly examined my eyes, and I discovered that he had trained in Oxford. At the end he said, "Is there still a pub in the lane near the Geology Department?" I replied, "Yes, the Lamb and Flag." "Do you ever go in there?" "Yes, a group from the lab goes almost every evening." "Do you still notice a problem with your eyes after you have had a pint of bitter?" "Well as a matter of fact I do not." "Ah, I thought so. You are worrying too much about this. Just have another pint and relax." Medical advice I still diligently follow.

Joining the ROM was pure luck. I knew very little about the place, but I soon realized that it was perfect for someone with my sense of science, salesmanship and independence. It was an exciting time, and I expanded my serpentine research, built my own microbeam X-ray and thermoanalysis labs, and made research visitors welcome. Thermoanalysis led to partnerships with several scientists on a series of new mineral descriptions.

It was during these early ROM days that a hippy wearing purple bell bottoms with a strip of little pink pompoms running down the outer seams walked up to me at a GAC–MAC meeting in Edmonton. He began talking to me as if he had known me for years. Thus I met Frank Hawthorne, who has been a friend, mentor and companion on many mineral adventures. We began to attend the Tucson Gem and Mineral Show every year to look at, talk about, learn about and purchase minerals. This was the perfect outlet for me to realize my combination of talents and the perfect place to build the ROM mineral collection. Over the years I added to the mineral, gem and meteorite collections, and to Earth Science galleries, a total of more than $10,000,000 in contributed funds and donated specimens. So I am a salesman, not only a scientist. My father would have been proud.

I am also cross-appointed to the Department of Geology at the University of Toronto, and this gave me the opportunity to supervise graduate students, most of whom were women. My mother would have been pleased. Terri Ottaway suggested that I supervise her M.Sc. thesis on emerald because most emeralds occur in pegmatites associated with serpentinites, and this would fill a gap in my knowledge. Thus, I found myself in the black shales of Muzo, Colombia, miles from any serpentinite. However, standing in the mine, I realized that gem deposits had rarely been studied as ore deposits, using modern analytical methods. Thus a new area of research in gems opened up to me, one that combined the assets of the museum with those of the university.

One of my exciting ROM–UofT moments occurred when Grant Henderson suggested I get interested in atomic force microscopy and go to Santa Barbara to try it out. I will never forget the thrill of that visit. I was sitting in the Digital Instruments test lab with half a dozen microscopes and scientists looking at atoms at the surface of various solids. All the operators were physicists, deeply tanned, dressed in shorts and T-shirts, and evidently surfers in their spare time. It was an exciting, unreal experience, more like a locker room than a lab, but we were seeing and manipulating atoms!

Inevitably the longer you are in a place, the less time there is for research. Now that I have retired, the thrill and excitement of research have returned, and I am a very happy mineralogist. I thank my daughter Claire, my partner Lancelyn Watters, and my niece Skyler Chiurka for their support and for enjoying this event with me. Claire and Lancelyn are almost as good at editing as Bob Martin. Thank you MAC for awarding me the Past-Presidents' Medal.

Fred J. Wicks