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Editorial

Preface: Flow of rocks – A Special Issue celebrating the contribution of Paul F. Williams to mentoring

This is the second Special Issue of this Journal dedicated to Paul F. Williams. The first one was a double issue published in 2001 (volume 23, Numbers 6/7) entitled *Evolution of Structures in Deforming Rocks*, honouring Paul's scientific career. The current issue more specifically celebrates his contribution to mentoring. The papers in this issue are mostly from a special session at the 2009 Joint Assembly in Toronto of the American Geophysical Union, the Geological Association of Canada and five other geoscience organizations. We call the issue *Flow of Rocks*, after the title of a graduate course that Paul offered for over two decades.

Paul's contribution to mentoring is highlighted by his being awarded the first **Mentorship Medal of the Canadian Federation of Earth Sciences** at the Joint Assembly (Fig. 1). We find it most fitting to start the Special Issue with the citation and acceptance remarks for the Mentorship Medal.

Citation (By Bill Mercer, the President of the Canadian Federation of Earth Sciences)

Mentoring is a critical part of professional and academic development and is vital to the health of the Science enterprise. The Mentorship Medal of the Canadian Federation of Earth Sciences recognizes the sustained and inspirational mentorship of colleagues, employees and students. This medal has been struck in honour of Paul F. Williams, who is also its first recipient, for his outstanding achievements both as a mentor and as a scientist. This citation blends the words of no less than fourteen scientists from five countries, including his peers, collaborators, former students and post-doctoral fellows.[1]

Paul Williams was born in England in 1938. He obtained his B.Sc. from the University of Durham, England, in 1959 and his M.Sc. from the University of New South Wales, Australia, in 1965. He completed his Ph.D. at the University of Sydney, Australia, in 1969. After serving as a Lecturer at the University of Townsville, Australia in 1968 and 69, and as an Assistant and Associate Professor at the State University of New York at Albany, U.S.A. from 1970 to 72, he became a professor at the Institute of Geology and Mineralogy at Leiden University in the Netherlands in 1972. His collaboration with Bruce Hobbs and Win Means in the early 1970's (Fig. 2) led to the publication in 1976 of the textbook *An Outline of Structural Geology* which is regarded as one of the most influential structural geology textbooks of the 20th century. Paul moved to Canada in 1980, to serve as Professor and Chair of the Department of Geology at the University of New Brunswick. He officially retired in 2003 and has been a Professor Emeritus at UNB since.

Fig. 1. Paul Williams (right) accepts the Mentorship Medal from Bill Mercer, President of the Canadian Federation of Earth Sciences.

Paul Williams, a Distinguished Fellow of the Geological Association of Canada (GAC), is an internationally respected structural geologist who has tremendously influenced science and scientists around the world through his publications, collaborations, and mentoring. Among his many contributions to the Canadian Earth Sciences is the founding of the Canadian Tectonics Group. For almost 30 years now the group has held annual meetings and field workshops to provide an informal yet academically rigorous environment for Canadian structural geologists to present their work, and in particular for students to give their first professional talks.

Few people, in Canada or beyond, have a track record in mentoring better than Paul Williams. Of the about 50 students and post-doctoral fellows Paul trained and mentored (Fig. 3), mostly

[1] The citation blends words from the following: Colleen Elliot, Laurel Goodwin, Guido Gosso, Andrew Hynes, Dazhi Jiang, Bruno Lafrance, Shoufa Lin, Gordon Lister, Brendan Murphy, Cees Passchier, Jim Ryan, Iole Spalla, Janos Urai, and Cees van Staal.

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at the University of New Brunswick, 18 of them are now university professors or lecturers in Canada, USA, Australia, Africa, Asia, and Europe, 5 are scientists at government geological surveys in Canada and the USA, and many more have successful careers in the private sector throughout the world. Some have become global leaders in structural geology and tectonics and many are successful mentors themselves. Two former students have written influential textbooks, and at least three hold or have held senior editorial positions in leading international journals. Awards and honours received by former students and post-doctoral fellows in Canada include the GAC Hutchison Medal (twice), the GAC Mineral Deposit Division's Gross Medal (twice), Governor-General's Gold Medal (three times), the GAC Structural Geology and Tectonics Division's Best Thesis Award (at least four times) and Best Paper Award (at least twice), and the Mary-Claire Ward Geoscience Award (once).

Paul is a tremendously skillful and devoted mentor. His approach varies from student to student, but some common themes are clear. He is critical and has high expectations of his students, and at the same time he is also caring, encouraging and helpful. Although a very busy person, Paul is generous with his time. He is stimulating and inspiring, encourages discussion, and freely shares his endless supply of ideas. His hands-off approach to supervision lets students build self confidence, but he is available to give timely advice when needed. His unparalleled field skills and his emphasis on rigorous field observations have also served his students and post-doctoral fellows well; Paul emphasized mapping and production of a geological map in his students' theses. He also emphasized the importance of having an eye for detail – from thin sections to outcrops – and a mind for the whole – from orogens to global tectonics.

Paul involves the members of his research group through the entire research process, from project definition to write-up. He is a model of integrity in scientific research and in personal relationships. He expects his students and post-doctoral fellows to act with similar integrity, to honour the data they collect, and to perform their professional responsibilities ethically and well. It is this expectation, and his ability to recognize and nurture potential in others, that makes him one of the most effective mentors. And once results are ready for publication, Paul doesn't stand in the way of his protégés: he only agrees to be listed as a co-author when both he and the student agree that he has made substantial contributions – and when he agrees with the interpretations!

Fig. 2. Paul Williams with Win Means (left) and Bruce Hobbs (right) in Central Australia.

Paul treats his research group like a family. He and his wife, Pam – who deserves a medal in her own right – regularly bring the group into their home for food, entertainment and more. He and Pam have patiently ushered many young scientists through first loves, lost loves, home sickness, and existential angst of all kinds. Sure, he gives career guidance, but more than once he has been required to act as marriage counselor. Perhaps unknowingly, he and Pam have been and continue to be parenting role models.

As in any family, Paul's relationship with 'his people' does not end when they leave the nest. He steps in whenever asked to help secure post-doctoral positions, faculty positions, promotions, grant funding, and whatever else he can provide. This gift, however, comes with the expectation that protégés will act with integrity and high intellectual standards. And 'his people' know when they are missing the mark!

Paul's contributions, both as a scientist and as a mentor, are highly appreciated by his peers and students alike. A joint Geological Association of Canada NUNA and Canadian Tectonics Group conference held in his honour in Canmore, Alberta in 1998 was attended by over 100 people from 11 countries in five continents; many of them were colleagues or former students (Fig. 3). The Journal of Structural Geology published a double issue in his honour in 2001. This Joint Assembly will have a special session and the Journal of Structural Geology is planning another special issue (the current issue) to celebrate his excellence in mentoring.

In summary, Paul Williams embodies every ideal of good mentorship. It is my honour to present him with the inaugural Mentorship Medal of the Canadian Federation of Earth Sciences.

Acceptance remarks (By Paul F. Williams)

It is a proud moment for me standing here today to receive the Canadian Federation of Earth Sciences/Fédération canadienne des sciences de la Terre Mentorship Medal. At the same time, I am humbled by the thought that there are many others at least as deserving. Gandhi is reputed to have said: "There are two kinds of people, those who do the work and those who take the credit. Try to be in the first group – there is less competition." I would like to think that I am from the first group, but here I am taking the credit. However, let me say that I am taking the credit on behalf of my students who have made me look good.

Looking back on my career I realize what a sweepstake life is! What we do and how well we succeed depends largely on serendipity, which has been likened to "Looking for a needle in a haystack – and finding a milkmaid". I have found more than my share of milkmaids – figuratively speaking that is!

It was a desire for an outdoor life that first attracted me to geology. I qualified with a B.Sc. and an interest in Palaeontology in the late 50s, when there was little work for geologists. I was glad therefore, of a job in Broken Hill, Australia – even though the migmatites were not very fossiliferous! Working there I discovered an interest in, and an aptitude for, Structural Geology. After 5 years prospecting high-grade rocks, I met Bruce Hobbs who was visiting the Hill with students. That chance meeting led to a rewarding relationship and a 50-year friendship. Having recently completed his

Fig. 3. Paul and Pam Williams with some of Paul's (former) students and post-doctoral fellows at Canmore, Alberta in 1998. From Left to Right: (front row) Dick Nieuwland, Rod Holcombe, Paul Williams, Pam Williams, Gordon Lister, Jürgen Kraus; (2nd row) Bruno Lafrance, Cynthia Dyck, Robin Willy, Jim Ryan, Colleen Elliot, Dennis Johnston, Laurel Goodwin, Yvette Kuiper, Bob Spark, Dazhi Jiang, Lori Kennedy; (last two rows) Paul McNeill, Ben van der Pluijm, Alain Caron, Karl Karlstrom, Bob Quartero, Jan van Bever Donker, Peter Aukes, Wouter Bleeker, Steve Ralser, Chris Beaumont-Smith, Janos Urai, Cees Passchier, Cees van Staal, Shoufa Lin, Martin de Keyzer, Sangi Hwang.

PhD, Bruce was a lecturer at Sydney University and had already attracted an enthusiastic group of students. This group, led by Bruce and Ron Vernon, made significant advances in our methods of analysis and understanding of rock deformation. I had the serendipity to join the group as a Ph.D. student in my new field of interest.

It was a fantastic learning experience. There was much discussion and friendly competition, the enthusiasm and interest were curiosity driven, and palpable. It shaped my own approach to graduate training and I have tried to maintain a similar group of self-motivated students ever since. It was Benjamin Franklin who said: "Tell me and I forget; Teach me and I remember; Involve me and I learn." Involvement in discussion with a group of peers is, in my opinion, a major aspect of mentorship.

Another serendipitous event was when Win Means read my thesis, and invited me to apply for a position at the State University of New York at Albany. Win introduced me to experimental deformation. He was a stimulating colleague with a habit of "thinking outside the box" – experimental deformation 'Win-style' used such household items as salt, mothballs, paraffin wax, urinal freshener tablets, bicycle inner-tubes and condoms (it was a more prudish time and no-one wanted to do the shopping). When Bruce joined us on sabbatical leave, our textbook "An Outline of Structural Geology" was conceived (gestation would have put an elephant to shame). Working on the book greatly increased my knowledge of the broader aspects of rock deformation and thereby improved my background for mentoring students.

The final step in the evolution of my approach came while working at UNB where I have now been for over half my working life. I realised the importance of following one's own curiosity. I now tell my students, when giving them field areas in which I have identified problems, to work on the suggested problems or identify problems of their own; I encourage the latter. I believe that this increases motivation and leads to greater originality. Unfortunately, this approach tends to increase the length of the project, but I believe it worthwhile.

I am convinced that my greatest contribution to geology has been through my students – I believe that I have learnt as much from interaction with them as they have learnt from me. I would like to take this opportunity to say **thank-you** to all of them, past and present, for their stimulation and friendship – without them there could have been no mentoring for me. In particular, I would like to thank those, who together with some of my peers, proposed this award. I would be remiss if I didn't name Shoufa Lin who spear-headed the proposal, and the societies that make up CFES/FCST who brought it to fruition.

My emphasis on fieldwork, and my maintenance of a fairly large group of students, has kept me busy. It would not have been possible without the understanding and support of my wife. Pam was always an out-door type, and she has accompanied me in the field, whenever possible, since the very start of my career. Our daughters also came along, starting from as young as 2 weeks, and continuing until mid teens! Between them, Pam and the four girls have experienced approximately 100 field seasons in various parts of the world, and now our grandchildren are queuing up.

We all look back fondly on those times. I thank them all for their love and support.

Thank you!

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