



AGS Distinguished Scientist Award. Gesner Medal 2012

Dr. Duncan Keppie

Duncan Keppie has a record of sustained excellence in geoscience for over 45 years, since he received his doctorate from the University of Glasgow (Scotland) in 1967. Duncan has an unparalleled combination of ability and passion for the geosciences, from the study of conical folds in the early 1970s to his recent research into the recycling of continental lithosphere through subduction erosion and extrusion. In total, his research has produced more than 150 refereed journal publications, more than 40 book chapters, editing of 7 books or journal special issues, and a host of government publications, maps, and memoirs. The numbers are still rising, with seven published papers in refereed journals in 2011 and several already in press for 2012. But the numbers and statistics only begin to tell the story. He is an excellent motivator and innovator and has an infectious enthusiasm for the earth sciences

His papers are not just a documentation of the evolution of various orogenic belts; they are also process-oriented: the principles and processes that form the conceptual core of his research can be applied to the structural evolution of other orogenic belts throughout the world and provide a theoretical framework for the understanding of the evolution and growth of continental crust.

Duncan's career has been spent with geological surveys and universities in Zambia, Nova Scotia and Mexico. Trained as a structural geologist, Duncan was soon bitten by the plate tectonic bug, and paleogeographic reconstructions became one of his most enduring scientific legacies, helping to place the geology of Atlantic Canada and Paleozoic Mexico onto the world stage. One of his major research assets is his unparalleled ability to grasp the essence of concepts and synthesize geological data from a very wide range of earth science fields and from seemingly disparate, unrelated pieces of research. He has published papers not only in the field of structural geology and tectonics, but has also been the driving force and inspiration behind many papers in metamorphic petrology, geochronology, paleomagnetism, igneous petrology, geochemistry, stratigraphy, sedimentology and paleontology, among others.

He was the one of the first geoscientists to interpret the geology of Nova Scotia in terms of plate tectonics, to apply the principles of terrane analysis to the Appalachians, and to extrapolate this analysis to include the circum-Atlantic orogens and Mexico. As a senior geoscientist at the Nova Scotia Department of Mines (now Nova Scotia Department of Natural Resources), his mandate was to provide structural and tectonic maps and models for the province in order to complement parallel studies in mineral deposits. To the international geoscience community, he was a catalyst that made Nova Scotia geology come alive on the world stage. His thought-provoking theories and hypotheses encouraged and challenged us to participate. He was an articulate and passionate advocate of his own hypotheses, yet was not afraid to abandon them and admit he was wrong when the weight of scientific evidence told against them. In the bigger picture, he had the vision to realize that by deducing the tectonic evolution of terranes and tracing back their relative motions, new mineral discoveries in places such as Iberia, West Africa, Arabia and Columbia would have immediate impact on exploration in Nova Scotia because of their proximity at the time of mineralization. He set out to understand the structural and accretionary history of Nova Scotia terranes within the Appalachian orogenic belt and rapidly became a world-renowned expert on the relationship between structural evolution and tectonics in the Appalachians. Arguably, he was the first geoscientist to apply the terrane concept to the Appalachians. He recognized the importance of precise geochronology, combining with researchers such as Tom Krogh and Dave Dallmeyer to provide high quality U-Pb and Ar-Ar data and high quality geochemistry (i.e. his collaborations with Jarda Dostal).

These abilities and interests led Dr. Keppie to initiate and organize several highly successful IGCP (International Geological Correlation Program) projects and conferences, most notably the Circum-Atlantic project which has brought together experts from countries that border the Atlantic. By bringing together geoscientists from a wide variety of ethnic and cultural backgrounds, he overcame language barriers and coordinated their contributions, culminating in the publication of papers, field guides and books in addition to a terrane map for the Circum-Atlantic orogenic belts. At present, Dr. Keppie is co-leader of an IGCP project involving earth scientists from both the Circum-Atlantic and Circum-Pacific regions whose mandate is to discuss global-scale structure and tectonics in the Paleozoic with the purpose of understanding the origin and evolution of Pangea.

Duncan became a Professor at the Universidad Autónoma de México (UNAM) in 1995 and immediately set out working on circum-Atlantic, circum-Pacific terrane connections. His recent papers on the structural evolution of Mexican terranes and those outlining tests on the "Baja-BC terrane connection" directed his attention to the Pacific Rim. Even more impressively, he has skillfully deduced the relationship between the Paleozoic evolution of the Mexican terranes with that of Appalachian terranes. In doing so, he has provided another dimension to understanding of Appalachian tectonics, continuing to author or co-author many influential papers on the evolution of Appalachian terranes and the relationship between them. Duncan has maintained active involvement and mentorship of students throughout his career. He was the prime motivator in the successful inter-university international field school, a three credit course involving students from Mexico (UNAM), United States (U. Arizona, Ohio U.) and

Canada (St. F.X., St. Mary's, Windsor). Most recently, at UNAM, he has supervised many graduate students and post-doctoral fellows. I have heard Duncan give several talks to students in university settings over the years. All were captivating in their clarity, demonstrating how to challenge the conventional wisdom, and showing an uncanny ability to trigger intellectual curiosity and convey difficult concepts in an understandable manner. Duncan has been a truly inspirational scientific leader for a generation of graduate students and young faculty, many of whom have also been subjected to his infectious enthusiasm for accordion-playing and Scottish dancing! On a personal note, he has been a great mentor, and it has been a pleasure working with him and learning from him on rocks from around the globe. In addition, we are delighted that he has passed his passion for geology on to his son, so that we will be reading insightful Keppie papers for decades to come.