Presentation of CIRMMT Lifetime Membership to Prof. Albert S. Bregman

19 June 2008

Dear Colleagues and Friends,

It gives me great personal pleasure to welcome Al Bregman as the first CIRMMT Lifetime Member in recognition of his outstanding career in the science of hearing. Al has worked in the area of Experimental Psychology for nearly 40 years, primarily studying auditory perception, but with occasional forays into visual perception as well. He has directed his entire career toward understanding the way human listeners succeed in perceptually organizing the complex acoustic field into distinct sound sources and into the events and event streams they produce. Within this study area, Al has made the most significant theoretical contributions of any of a large number of scientists working in the sub-discipline of auditory psychology. His conception of perceptual organization draws its main inspiration from the Gestalt psychologists, but he has brought many concepts from computer science and artificial intelligence to bear on his theorizing, leading to the development of such concepts as 1) primitive auditory scene analysis being an heuristic process to which a number of possible acoustic cues and sensory mechanisms contribute, 2) schema-based auditory organization being a selective process that draws information from the complex acoustic mixture according to pre-activated knowledge, and their interaction in 3) the old-plus-new organizational strategy, which provides a framework for understanding how perceptual continuity is perceived in the face of interrupting signals that can potentially mask a softer continuous target signal.

His experimental work has provided an impressive edifice that was summarized in his monumental book *Auditory Scene Analysis: The Perceptual Organization of Sound* published by MIT Press in 1990. This book, which has over 1200 citations according to Web of Science, is in my mind the modern-day equivalent of Hermann von Helmholtz's *On the Sensations of Tone as a*

Physiological Basis for the Theory of Music published more than a century earlier. Al has generated a large number of empirical findings too numerous to cite here. Suffice it to list a few findings that he and his students have published. Auditory stream formation (the organization of sequences of events into coherent mental representations) is based on a principle of continuity in the sensory representation of the sounds. Auditory streams are the "objects" upon which attention is focused. The perception of sequence properties such as melody and rhythm are confined to sounds organized into auditory streams and are difficult to perceive across streams. And a continuous sound interrupted by a louder sound that covers the spectrum of the continuous sound can be perceived as continuing through the louder sound even if its properties are changing over time, as long as a process of interpolation can logically connect the bits of isolated sound perceived on either side of the interruptor.

Al's work, particularly since the publication of his book, has stimulated a plethora of research in experimental psychology, cognitive neuroscience, artificial intelligence, signal processing, and even auditory neurophysiology, in Québec and Canada in particular, but also in North America generally, Europe, Japan and China. This richness of aftermath is in large part due to the impressive theoretical framework Al laid out, which gave many younger researchers a clear starting place to engage many of the issues brought to light by the framework itself over and above the explanations it brought to existing data. In this sense, Al's contribution to the field of auditory psychology is unique in the latter half of the last century, both in terms of its experimental breadth and theoretical depth. This uniqueness is to be measured at an international level, and quite clearly places at the forefront Al's contribution to psychology as a 20th and 21st century science in Canada, alongside other great Canadian psychologists and cognitive neuroscientists such as Donald Hebb, Endel Tulving, Ronald Melzack, Brenda Milner, and John MacNamara.

In addition, Al is a truly gifted mentor. His clarity of thought, deep interest in his field and in other fields as diverse as computer science, neurophysiology and philosophy, and in particular his great generosity of ideas and suggestions, have been a boon to a significant number of undergraduate and graduate students and post-docs. I can personally attest that as an undergraduate research advisor, Al taught me to think as a scientist and to take immense pleasure in the problem-solving enterprise that constitutes an experimental science. When my financial situation didn't allow me to continue on with a graduate education immediately after my undergraduate degree at McGill University, he took it upon himself to find a situation that would at least allow me to continue doing science as a research assistant, which eventually led to my being able to continue on and be here today. Al has always manifested a deep devotion to science and to young scientists throughout his career as a teacher and mentor.

Another aspect of Al's personality that makes him an uncommon scientist is his extreme generosity. He is always willing to respond to a letter from someone seeking an answer to some question of auditory perception or perceptual psychology in general and is never condescending to those who know less than he or who come from other disciplines with different vocabulary and concepts. In line with this spirit of stimulating the collective advancement of auditory science, he created a listserv network on the Internet called simply "Auditory" which has become the key discussion network for people interested in auditory perception and cognition the world over.

In sum, Al is an exceptional man and scientist in many ways, both professional and personal, and it is only fitting that he be the very first recipient of a CIRMMT Lifetime Membership. My dear colleagues and friends, please rise and join me in honouring the greatest member of CIRMMT to date, our dear friend and colleague, Al Bregman.

Stephen McAdams, CIRMMT Director