



Vancouver Geotechnical Society

A Local Section of the Canadian Geotechnical Society

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NOTICE OF UPCOMING DINNER PRESENTATION

2011 FALL CANADIAN GEOTECHNICAL SOCIETY

CROSS CANADA LECTURE TOUR

THURSDAY, NOVEMBER 03, 2011

SUBJECT: The Science of Judgment

SPEAKER: Mr. Steven G. Vick , P.E.
Author and independent consultant

Author and independent consultant Steven G. Vick has based his practice in the mountains of Colorado for the past 25 of his 40 years in the profession. Long specializing in mining geotechnics, his first book Planning, Design, and Analysis of Tailings Dams remains the classic text on the topic and has been in print continuously for almost 30 years. Focusing on dam safety aspects, in the 1990s Vick spearheaded the first catalog of tailings dam failures, compiled by the U.S. Society on Dams.

Beginning with graduate research at MIT, his other main interest has been risk and probabilistic methods. In a crossover application, Vick helped pioneer risk analysis in dam safety with the U.S. Bureau of Reclamation and other damowners in Canada and elsewhere. This led to publication in 2002 of Degrees of Belief, the only book of its kind exploring the interface between subjective probability and engineering judgment. Drawing on fields beyond engineering, it has been called a “masterpiece of Natural Philosophy.”

A veteran of Klohn Leonoff’s former Denver office, Vick has always had close ties with the Canadian geotechnical community. For him, this enhances the honour of presenting the fall 2011 Cross Canada Lecture Tour.

CONTENT: Since Ralph Peck asked in 1980 where judgment had gone, there has been little sign of its return, and engineering judgment is privately viewed in some circles as a metaphysics for the elderly or the analytically inept. This lecture seeks to revive the concept of engineering judgment by elaborating its principles and establishing its foundations in cognitive and behavioural research.

First, judgment is fundamentally inductive—using specific cases to arrive at generalizations, a property it shares with all branches of science, with only mathematics being wholly deductive. This may seem to put judgment at odds with the mathematically deductive character of engineering analysis that reasons the other way around—from the general to the specific, from first principles to what passes for objective truth. But in all engineering problem solving, it is the judgmental induction of diagnosis that precedes deductive analysis, and inductive judgment of interpretation that follows.

Inductive judgment and deductive analysis are complementary. Neither is right or wrong; they do different things. In deductive analysis, *if* all of the premises (assumptions) are true, then the conclusion (results) must be true. Induction cannot arrive at unequivocal truth, it can only find something to be *probably* true.

Inseparable from judgment then is the notion of probability, and the relation between the two has much to say about judgment's cognitive basis. Within this framework, the lecture develops the following topics in a geotechnical context:

- Causal and statistical reasoning strategies
- The relationship between experience and judgment
- The role of case histories
- Weighing evidence: the importance of lists
- Calibration and feedback
- Mental simulation and Homer Simpson
- Risk analysis in diagnosis and visualization
- Geology in diagnosis and visualization
- Pattern recognition, experience, and case histories
- Intuition, hypothesis, diagnosis, and pattern recognition: Henri Poincaré
- Situational awareness: seeing the Big Picture

For many, this framework will provide a new perspective on judgment. It does not merely assert, it establishes why judgment is a necessary component of all engineering problem solving, far from the nebulous accessory it has often been taken to be.

DETAILS

Executive Inn, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6 (Phone: 604-298-2010)

Social Hour: 5:30 to 6:30 pm (drinks available at the hotel bar)

Technical Presentation: 6:30 to 7:30 pm

Dinner: 7:45pm (\$10 will be charged for dinner to cover a small portion of the cost.)

RSVP: Dinner reservation to ali.amini@shaw.ca by Monday, October 31, 2011

The VGS would like to thank the following companies (in alphabetical order) for financially sponsoring this Cross Canada Lecture Tour:

- *BGC Engineering Inc.*
- *EBA Engineering Consultants Ltd.*
- *Golder Associates Ltd.*
- *Klohn Crippen Berger Ltd.*

The Cross Canada Lecture Tour is organized by the Canadian Geotechnical Society and its various local sections, and travel funds are provided by the Canadian Foundation for Geotechnique.