

Engineering Matters

Hopkins Lecture 2002

Noel Nathan Lecture 2012

Park and Paulay Lecture 2019

David C Hopkins

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David Hopkins

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Acknowledgement

The lectures contain numerous images from various sources which have not been individually acknowledged. The author is grateful to those who made images available either personally or via the internet.

Foreword

There are many presentations on my computer covering engineering topics. This publication contains three of them, the Hopkins Lecture (2002), the Noel Nathan Memorial Lecture (2009) and the Park and Paulay Lecture (2019), each one a formal lecture. They illustrate my thinking at three different times – eight years before the Canterbury Earthquakes, one year after, and eight years after.

Each lecture is printed as it was at the time. No attempt has been made to update the material or add footnotes about events since that have changed perspectives.

Below I have provided background notes on the context, preparation, and presentation of each lecture. In each case it was a special honour, and much time and effort went into preparation both of illustrations and text. The Hopkins Lecture was targeted at a lay audience, while the Noel Nathan and Park Paulay Lectures were prepared for engineering audiences.

I have found that I really enjoy the process of putting material together – both text and illustrations. The challenge of assembling material to be understood by others, lay people or engineers, is a test of one's understanding of the subject.

Why have a hard copy publication? Mainly for family as a record but perhaps of interest to some engineers in the future. Although electronic media dominate our lives today, books in hand allow a ready appreciation of the whole and are easier to dip into than a memory stick. They seem a more fitting keepsake.

My hope is that those who dip into this book will find something that will stick in the memory and maybe change their perspective at least a little or provide deeper knowledge and insight into the world of structural and earthquake engineering. The many illustrations are intended to help get points across.

The slide presentation format of each lecture has been retained – showing each slide and comments made at the time.

Hopkins Lecture - Christchurch 2002

The Hopkins Lecture Fund and annual lecture was set up at the instigation of Toby Richards, a US professor on sabbatical to the University of Canterbury, where my father was Head of the Civil Engineering Department. Dr David Elms, a British engineer on the staff at the time gave crucial input and impetus.

The establishment of the Fund and Lecture were timed to coincide with the retirement of Professor Harry Hopkins in 1978, and he gave the inaugural Hopkins Lecture that year: *A Land of Bridges – A story of New Zealand*. Bridges were his passion. He spent sabbaticals in 1959 and 1968 in preparing his book *A Span of Bridges* published by David and Charles in 1970.

The Lecture has been held annually ever since. Professor Bob Park, my PhD supervisor, was active in promoting it and encouraging speakers. I was usually consulted informally

on possible speakers as part of a Hopkins Lecture Committee. A long line of notable speakers gave the Lecture between 1978 and 2001, and it did not occur to me that I might receive an invitation to give a Hopkins Lecture.

I had recently left my long-time employer, Sinclair Knight Merz (previously Kingston Morrison and before that KRTA) to become a one-person consultant specialising in earthquake risk management. This gave me the time necessary to do justice to the Hopkins Lecture tradition and to my father. Obtaining information about Dad, who died in 1986, was most gratifying – resulting in the Personal Postscript at the end of the Lecture. (This was not part of my presentation, but the first questioner, with no prompting from me, commented that I had said little about my father. This gave me the chance to share the Postscript in full!)

My departure from my role as Director of the Buildings Division at Sinclair Knight Merz marked a turning point and allowed me to look back on over 30 years of consulting engineering. I reflected on detailed design work on the National Theatre in London to directing the activities of a large group of structural engineers, architects, building services engineers and quantity surveyors on a wide range of projects in New Zealand and overseas. This is the main theme of my Hopkins Lecture – using my wide and varied experiences to illustrate some key points and lessons.

The title came about after I reflected on how fortunate I had been to work in different countries with professional and other people on projects ranging from a 600-bed teaching hospital in Thailand to devising a Combined Earthquake Hazard Map for Wellington. The technical aspects and the responsibilities involved offered plenty of professional challenge. But, looking back, I was struck by how lucky I had been and how much fun I had. Hence the title: *Consulting Engineering – Serious Fun*.

At the time and ever since I have realised what a special privilege it was to give a Hopkins Lecture. I put vast amounts of time into what was a deeply satisfying experience.

Noel Nathan Memorial Lecture – Vancouver 2012

Immediately following the 22 February 2011 Earthquake I spent three weeks in Christchurch CBD helping assess damaged buildings of more than six storeys – leading the Critical Buildings Team. I arrived at 9am on 23 February – on a flight that I happened to have already booked to come down for a Hopkins Lecture Committee meeting. Happily, the airport was open.

My brother, Andrew, picked me up and drove me to the meeting venue – the Engineering School. I said there would be no meeting, given the damage from the earthquake. But Andrew insisted we go to the Engineering School. There was not a soul around. The doors were open, though, and we were able to enter. We went to the Civil Engineering Department on the 4th floor and noticed that portraits of Tom Paulay and Bob Park had fallen off the walls. Dad's portrait was not affected seriously. We stowed them in a safe place and left.

I then reported to the Emergency Operations Centre in the Art Gallery and was assigned the task of reviewing that building's suitability for such a role! Luckily, Grant Wilkinson who had designed the building happened to be on hand to help. The next assignment was the Hotel Grand Chancellor which was damaged and leaning with possibility of collapse. USAR personnel could not enter the building until it had been checked and stabilised. Many other buildings were reviewed by the Critical Buildings Team. Teams were allocated each day to inspect nominated buildings and report back. My role was a mixture of active inspection and leading the discussions to decide on what actions were necessary to make each building safe. I arrived around 7am each day and left around 10 or 11pm, wondering where the time had gone in a frenzy of activities and interactions.

Engineers and building inspectors turned up each day and were assigned tasks. No-one knew who would come on any day. We just grabbed any volunteer with experience of multi-storey buildings and assigned them to our team. There were several overseas teams visiting and I knew some of the members through my international associations. One overseas person who proved particularly helpful was Ken Elwood from the University of British Columbia in Vancouver. He was immensely knowledgeable on reinforced concrete structures and was able to offer valuable insights which helped our decision-making greatly. He contributed over several days.

Once the frenetic activity was behind us, Ken contacted me and invited me to share my experience leading the Critical Buildings Team by giving the Noel Nathan Memorial Lecture in Vancouver in May 2012. I was delighted to accept. It turned out that my nephew James Robinson was getting married in Grass Valley, California in May and that I could attend that enroute.

My main recollections of giving the Noel Nathan Memorial Lecture were the wonderful hospitality of colleagues at UBC and the fact that I had rather a lot of material to share. Happily, a majority stayed till the end for questions.

It is important to recognise that the material presented was as things were in May 2012. Some things have changed, and events have offered different perspectives. But the lecture provides a snapshot of the aftermath of the Canterbury Earthquake of 22 February 2011 from someone who was closely involved in the structural engineering aspects.

Two personal postscripts are included, the first comparing my father with Noel Nathan, and the second relating the story of the painting *Moving Target* by my niece and talented artist, Marie LeLievre.

Park and Paulay Lecture - PCEE Conference Auckland 2019

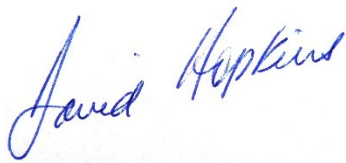
It was a huge privilege and pleasure to give the inaugural Park and Paulay Lecture at the Pacific Conference on Earthquake Engineering in Auckland. Bob Park and Tom Paulay had been my teachers and mentors over my career, starting with undergraduate days in the 1960s. They and their wives were close family friends. My father got on well with Bob

and Tom both of whom he admired greatly and whose social company he enjoyed on many occasions – often with a beer in hand.

Park and Paulay were internationally known and respected for their work on reinforced concrete structures. They had a special place in my professional and personal life. Such was the respect for them in New Zealand and internationally, it was not difficult to get support for the idea of a *Park and Paulay Fund* at the University of Canterbury. With assistance from the late Professor Nigel Priestley, I prepared material and promoted the idea. My respect and admiration are evident in the tribute which opens the Lecture. It is even more evident in the two eulogies included in this publication.

The Lecture content is basically a distillation of important structural issues and events in my career, together with my views on what should be done in future. This publication includes all the material I prepared for the Park and Paulay Lecture, some of which was omitted from the presentation – to fit within the time constraints.

It was a particular honour to present the Lecture to a room full of delegates and it was special to have my wife Helen and daughter Rachel present in the front row.

A handwritten signature in blue ink that reads "David Hopkins". The signature is written in a cursive, flowing style.

October 2024

Hopkins Lecture 2002

Consulting Engineering – Serious Fun



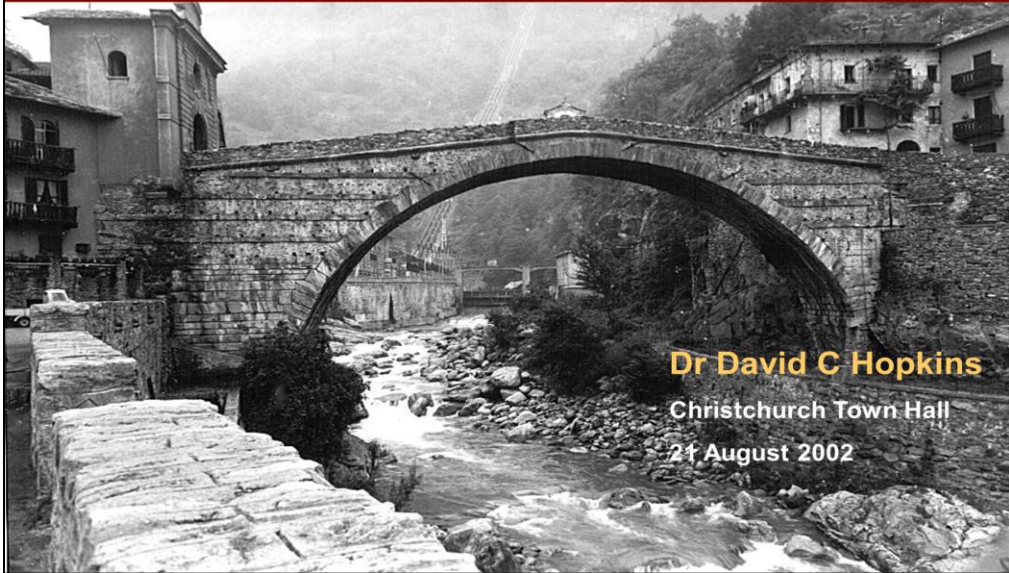
Dr David C Hopkins

Christchurch Town Hall

21 August 2002

Hopkins Lecture 2002

Consulting Engineering – Serious Fun



Chancellor Dame Phyllis Guthardt, Vice Chancellor Daryl Le Greuw, IPENZ Chairman Ross Major, members of the Hopkins family, distinguished guests, ladies and gentlemen. Thank you and welcome.

It is a very special honour for me to present the 2002 Hopkins Lecture, not just because of my connection to the late Professor Hopkins! Since the first lecture, given by my father in 1978, there has been a consistent array of distinguished speakers. It is an honour to be in such company.

The fact that the Hopkins Lecture is now established as an annual event is testimony to those such as Toby Richards, David Elms, Bob Park and Brian Wood who helped inaugurate it, and to many others for their support. Their efforts in making the vision of a commemorative lecture a reality are much appreciated by all the family of Harry and Dorothy Hopkins.

The support of the University and of the Canterbury Branch of IPENZ has been a key to the continuation of the Hopkins Lecture over the last 24 years. Thank you all.