TRINITY COLLEGE DINNER 4 DECEMBER 2021

Thank you Master for your kind words.

It is a great honour to mark my 80th birthday here at Trinity. Our College has always taken a broad view of learning and inquiry, engaging in projects and partnerships with diverse academic communities around the world.

My grandfather Maxwell Garnett, was made a Trinity Prize Fellow in 1910 for his contribution to the physics of light waves and glass colouration. Later he was to write on 'Education and World Citizenship' and became Director of the UK League of Nations Union.

His brother-in-law at King's, my great uncle, Lewis Fry Richardson - the meteorologist, co-inventor of fractals and conflict modeller - was an early inspiration. As a boy I holidayed with him on the west coast of Scotland – watching the lake eddies along Holy Loch – as he pioneered the mathematics of computerised weather forecasts. Some fifty years later, I would oversee this new mastery of weather systems as Director of the UK Meteorological Office. A previous Trinity mathematician, Gilbert Walker, had in the 1900's become head of the Indian Meteorological Service.

On graduation in engineering in 1963, my research career began under the guidance of Trinity Fellow, Arthur Shercliff, which led to my Fellowship for the understanding of wall - jet flows in magneto-hydrodynamics and instabilities. Today, this research is being developed in current nuclear technology. This would be an important part of any future, zero carbon, fusion generation system, the importance of which was discussed at last month's COP 26 meeting.

After 1970, I had the privilege of working in Cambridge with George Batchelor and Keith Moffatt, both Trinity Fellows, exploring how wind turbulence is distorted especially on impact with structures and over terrain. This led to our general formula of Rapid Distortion Theory, applicable to the study of the impact of high wind forces on tall buildings, and structures such as suspension bridges. This is also applicable to the modelling of complex dispersal of pollutants, which became the subject of a BBC OU Film.

In collaboration with Christopher Poulton at the Applied Psychology Research Unit in Cambridge, we combined engineering research with human and environmental sciences.

Using a large, specialized wind tunnel, we were able to measure how people are affected by turbulence when walking near tall buildings. An understanding of this sensitivity shaped the urban design for example at Canary Wharf, and the need for a roofed structure at its rail station.

One of my enterprising research students used this research to assist the British yacht team with a flexible sail design for the America's Cup competition. Sadly, on the day it was to be rolled out, there was an unwelcome absence of high winds….

Since the days of Isaac Newton at the Royal Mint, Trinity Fellows have contributed to practical knowledge at the interface between scholarship, society and government. And our new Master's contribution to public health is part of that tradition.

While a junior Fellow in the early 1970s, the former Conservative Cabinet Minister Rab Butler was Master, and he and his wife Molly created a welcoming hub of liberal Toryism in the Lodge. My involvement in local politics and election as Leader of the Labour Group on Cambridge City Council in 1972 was of interest to him as a fellow politician, and he gave advice and encouragement despite our opposing politics. A lasting achievement for me was the city centre pedestrianisation and traffic reduction – hard fought for at the time.

There were also strong debates whilst on the Trinity College Garden Committee, about Bin Brook and the avenue planting within the Fellow's Garden, famously with the elderly Mr Simpson and Mr Binnie.

During the 1970's there was significant social change, and this was reflected in the College student intake, including the welcome arrival of women students. As a College Tutor I found myself dealing with serious human and societal issues raised by my tutees. This was to change, and by the 1980's the students had evolved from jeans and bandanas into cords and tweed jackets.

While I served on the College Council, the Bursar, John Bradfield, was responsible for two significant developments – the Science Park and the College land at Felixstowe being developed into the great port that it is today. At this time, I started my company CERC on King's Parade which continues to work on air pollution and urban environmental problems.

The Council allowed me to remain a Fellow and continue in public service on my appointment as Director of the UK Meteorological Office in 1992. I strengthened the critical scientific research on global climate change, necessary

for greater predictive accuracy in a warming world of more complex and extreme climatic events. Operations using super computers enabled us to double the accuracy of the location and path of hurricanes. As a Member of the House of Lords, I spoke on the issues of UK and global environmental development and the need for open scientific collaboration.

The College has generously provided me with funds and freedom for my scholarship. It is a great honour to have had my papers lodged in the Wren Library, where they can, hopefully, contribute to future research.