

Conferment of the Degree of Doctor of Laws, *honoris causa* A Citation



Dr Song Jian, LHD (Hon), BEng, PhD, DSc

In 1990, the eminent Chinese scientist Dr Song Jian was invited to make a presentation on scientific research by the Bauman Moscow State Technical University. In fluent Russian, he discoursed on three topics, namely optimal control, population control and systems control described by partial differential equations. While these are three disparate areas of studies, Dr Song approached them from a macro angle and delved deeply into each of these three topics, at the same time piecing together his findings and observations seamlessly and cogently, upon which he then propounded his own views and theories. This was received with tremendous praise and applause from all present, and the chairman of the assembly remarked that the great learning of Dr Song should have earned him three doctorates, although on that occasion the University could only present Dr Song with a Doctor of Science degree, in recognition of his great achievements in higher learning. In point of fact this award in Moscow was only the conferment of a degree late by thirty years. Dr Song had early pursued advanced studies in the then Soviet Union, and had completed his doctoral thesis at the Bauman Moscow Higher Technical School in 1960. However, with the gradual deterioration of Sino-Russian relations at the time, Dr Song gave up the expected degree and returned to China where he had since been committed to the development of science and technology programmes.

The development of science and technology in China had gained great momentum since the 1960's, and the fundamental theoretical framework that had cast the greatest influence on this growth was the so-called control theory. Nowadays our research in disciplines such as systems engineering, life sciences and artificial intelligence is all based on the control theory. We make use of the transmission and feedback of information to facilitate the control or usage of matters, but there are so many modes of control and it is a new challenge to scientists as to which modes of control are more worthy, and which one of them would yield the best results. This newly developed pursuit in science is known as optimal control theory. Dr Song is a foremost authority on the subject and has made significant contribution to research in this discipline. As early as the 1960's, he succeeded in providing solutions to hard-to-manage theoretical problems such as stability, point-wise observation and point control of systems. In the 1970's he revised the book titled *Engineering Cybernetics* by Professor Qian Xuesen with his input based on expanded and more intense research, and advanced the study of cybernetics to new heights. The fruit of his research has been successfully applied to national defence constructions, remarkably in the design of the control system for the first generation of antiballistic missiles in China. In 1980 he participated in the overall design of a new type of missile fired from submarines, and has since been leading research and development in science and technology at the national level for the past three decades.

Research in optimal control theory has proved to be of tremendous application value in the management of social problems. As a leader of the country, Dr Song Jian has been



deeply concerned with the incessant growth in the national population. It is his view that the population in any society will have direct impact on the growth of that particular society, and that the increases and decreases in a nation's population are all subject to certain historical transitions and changes. Thus he created forecasts, based on quantitative models, for the growth in the national population of China within a hundred years. His forecasts had attracted attention from all sectors in Chinese society and the Chinese Government accordingly revised its policies on population control and planned fertility. He was the founder of the "Theorem of Double-edged Limit of Total Fertility Rates" which led to the formulation of population control models. *Population Control in China – Theory and Applications*, which he co-authored in 1985, was the first work in that specific field. This book is still revered as a major reference work nowadays in many countries.

Corollary to population growth are, of course, problems related to the people's livelihood. China has always been an agricultural country, and the "Sparks Programme", which Dr Song established in 1986 and targetted at the agricultural communities in the country, was an initiative to push forward the modernisation of agriculture in China through the introduction of appropriate science and technology. Its main purposes were to accelerate the industrialization of the agricultural communities, and to introduce corporatization to villages and townships. Now villages and towns all over the land responded enthusiastically to the sparks kindled by Dr Song. In 1988 Dr Song took it further by launching the "Torch Programme" to encourage the establishment of high technology industries throughout the country. Through this programme 52 regions were designated special areas for the development of new and advanced technology. These regions, where technological and economic developments have been successfully integrated, have contributed substantially to the development of the national economy as a whole. In 1992 Dr Song brought in the "Climbing Programme", under which emphasis was placed on key research projects of pioneering natures, and from then on Nation Building through Science and Technology has been enshrined as one of the principal policies for China's modernization. "Nation Building through Science and Technology" was a new slogan proposed by Dr Song, and on its basis he advocated the importance of further reinforcing the nation's educational services.

One of the most important elements in education is an understanding of history. Dr Song has once said that a love for one's country requires the study of one's national history. China is one of the four ancient civilizations of the world, and we know from our chronicles that three dynasties, namely Xia, Shang and Zhou, existed in the early days of our nation. However, our knowledge of history before the Shang Dynasty had been incomplete and lacking in accuracy. It was in 1995 that Dr Song, gathering the leading lights in their respective specialties, initiated the "Xia-Shang-Zhou Chronology Project" which involved over 200 scholars drawn from the specialist fields of history, archaeology, astronomy, science and technology. Under the coordination and guidance of Dr Song, this illustrious assemblage of leading scholars worked closely together and successfully carried out research on scores of special topics. Through the study of ancient texts, archaeological finds at historic sites, as well as astronomical records, the

Project produced astonishing findings and a wealth of research results. In 2000 *The Chronology of the Xia, Shang and Zhou Dynasties* was officially published. This work re-dated the founding of the Xia Dynasty to 2070 BC, provided clear chronological demarcations among the three Dynasties, and pushed back the beginning of chronicled history in China by 500 years. What was believed to be a people with three thousand years of chronicled history now proves to be a civilization over four thousand years old. This multi-disciplinary project once again gave solid proof to the outstanding leadership of Dr Song, and speaks much for his hot-blooded commitment to the history and civilization of the Chinese people.

The distinguished achievements of Dr Song have been widely recognized throughout the world. He has published copiously during his long career, with 12 specialist books and 160 learned articles to his credit, and has received numerous accolades and honours. He holds honorary doctorates from many leading universities worldwide and has been appointed fellows of national-level engineering academies in many countries. In 1995 Dr Song visited The Chinese University of Hong Kong for the first time, and since then his interest and concern for research and development at this University have not ceased. His great encouragement has contributed much towards our success in the furtherance of our research and development work in science and technology.

It is an ancient saying that "One's life has an end but there is no end to the pursuit of knowledge." By life's end is meant that space and time have cast their ruthless restrictions on us, and prevent us from seeking unlimited search for knowledge in its unfathomable realm. Dr Song Jian was born at a time when the country was suffering deeply from internal strife and external woes. Raised in poverty, Song Jian was teeming with self-confidence and zealous patriotism. Through his relentless efforts and firmness of purpose, he boldly moved from one region to another in academic research, meeting the challenges of both time and space head-on with much audacity. He is forward-looking, and has laid down many directions for the development of Chinese society in the years to come. At the same time he focuses his attention on history, and the origin of China's chronicled history is traced back over a thousand years before the commonly reckoned date. His control theorems emphasize how man may employ his intelligence to systematically exercise control and make useful utility of matters. His "Spark" and "Torch" programmes mapped out a blueprint for the education and nurture of a new generation of Chinese youths, and with the strategy of Nation Building through Technology and Education he aims for economic growth and social progress. Dr Song has a firm conviction in that one's fate may be changed with the acquisition of knowledge, and that his own success is the best proof for his conviction. He once said that "One laments over the brevity of human life, and the endlessness of the Changjiang. We must all endeavour to win time from Nature, by living longer and doing more." Born in December 1931, Dr Song is close to eighty years in age but still going strong, taking all that comes his way in his stride. Today we rejoice in the longevity of the benevolent, and speak of the virtue of the wise, to the greater glory of the Chinese University. Mr Chancellor, may I present to you Dr Song Jian for the award of the degree of Doctor of Laws, *honoris causa*.

Conferment of the Degree of Doctor of Laws, *honoris causa* A Citation



Dr the Honourable Henry Tang Ying-yen, GBM, GBS, DSSc (Hon), LLD (Hon), DBA (Hon), BA, JP

In the famous text "Zi Chan on Yin He as governor of the state" which is part of the *Gems of Chinese Literature*, great emphasis is placed on the importance of "learning before entering into government", by which is meant that it is essential for someone to acquire practical, hands-on experience prior to taking up the task of governance. This is certainly the path chosen by Dr the Honourable Henry Tang Ying-yen, Chief Secretary for Administration.

Dr Tang Hsiang-chien, the father of Dr Henry Tang, was a pioneer among Hong Kong industrialists in establishing enterprises on the Mainland, having set up his textile business there as early as the 1970's. Dr Tang Hsiang-chien was also a forerunner in launching the electronics industry in Hong Kong in the early 1980s by introducing state-of-the-art technology and providing specialist training for those committed to research and development in the field. Brought up in a family dedicated to the advancement of Hong Kong's manufacturing industry, Dr Tang majored in Psychology at the University of Michigan where he obtained a Bachelor of Arts degree. He stayed on in the United States to further his studies, and returned to Hong Kong in 1976 to take up his father's business. He developed the family enterprise of garment manufacturing, while upholding the immaculate approach to work for which his father, Dr Tang Hsiang-chien, was well-known. He applied himself diligently to every aspect of business operations, making himself an illustrious entrepreneur in Hong Kong. He was presented with the Young Industrialist of Hong Kong Award in 1989. In 1993 he was named a Global Leader for Tomorrow by the World Economic Forum, and he was the Chairman of the Federation of Hong Kong Industries for three consecutive sessions, from 1995 to 2001. He was also a Committee Member of the Hong Kong General Chamber of Commerce. Through a series of high-ranking commitments in commerce and industry over the years, Dr Tang has accumulated substantial experience in practical, hands-on work, and gained profound understanding of how Hong Kong society works in its various strata. Most importantly, such experience and understanding have enabled him to win the trust of the commercial and industrial sectors, which entrusted him with important public responsibilities. From 1991 to 1998 Dr Tang was a member of the Legislative Council and, as a bridge between the various segments of our society and the Government, he functioned as a major channel of communication between the two. In 1997 he was appointed to the Executive Council, whereby he took part in the drawing up of public policies in Hong Kong at the highest level.

In 2002, Dr Tang was invited to join the Government of the Hong Kong Special Administrative Region, and took up the post of Secretary for Commerce, Industry and Technology. In this capacity Dr Tang's purview comprised international trade, resources and support for commerce and industry, foreign investment, information, technology, telecommunications, broadcasting, films and the creative media, as well as intellectual property.



During his time in office, that is, from 2002 to 2003, Dr Tang gave tremendous support to the Small and Medium Enterprises (SME) and his efforts, including the Special Loan Scheme for SMEs and expanding credit entitlement opportunities for more projects, provided great impetus to the further growth of the SMEs as well as the continued vitalization of the economy in the Pearl River Delta. Furthermore, Dr Tang played a significant role in the successful conclusion of the Mainland and Hong Kong Closer Economic Partnership Arrangement (CEPA): as the result of his efforts for an entire year, agreement was finally reached whereby the Mainland and Hong Kong would both benefit from complementary and reciprocal business arrangements, to the great economic advantage of both.

In August 2003 Dr Tang was appointed Financial Secretary of the Hong Kong Government. It was a most difficult and trying time for the city, with the economy at an all-time low due to the SARS virus. Dr Tang wholeheartedly devoted his time and energy to his duties and, working closely with all parties concerned, finally put the economy on the road to recovery. In those days the Hong Kong Government was suffering from an enormous deficit in its finances, but in his four years as Financial Secretary, Dr Tang was able to turn the situation around, bringing the public accounts back into the black.

Since his assumption of the office of Chief Secretary for Administration in July 2007, Dr Tang has assisted the Chief Executive in administration, planned and coordinated major policies across different government departments. However, despite his onerous workload, he always remains personable and pleasant. Such ease and modesty spring from a receptive mind and generosity of spirit, as well as a steady and practical approach to matters at hand. He is a great listener much admired for his ability to assimilate gathered opinions and translate them into workable schemes of action. When a policy is being implemented, he encourages team spirit within the ranks of Government to ensure that there is well-knit cooperation among the agencies involved.

During the Beijing Olympics in 2008, Dr Tang assumed the duties of the President of the Equestrian Committee (Hong Kong) and successfully planned and organized the equestrian events in Hong Kong. In May 2008, after a devastating earthquake struck in Wenchuan, Sichuan Province, Dr Tang was the Chairman of the Steering Committee for Reconstruction in Sichuan Earthquake Stricken Areas, and has been working closely with the community in Hong Kong to provide assistance and support to fellow-countrymen in Sichuan as they rebuild their homes.

Since October 2008, Dr Tang has been Chairman of the West Kowloon Cultural District Authority. In that capacity he has spared no effort in bringing the project towards realization. Furthermore, as the Chief Secretary for Administration, Dr Tang has been a principal advocate for greater cooperation between Hong Kong and Guangdong, in particular the Pearl River Delta, in the infrastructure, economy, social and cultural areas.

Over many years Dr Tang has participated in the work of numerous Government committees and public organizations. These have included the Trade Development Council,



the Town Planning Board, the Labour Advisory Board, the Construction Industry Review Committee, the Community Chest and the Council of the City University of Hong Kong. In all these offices he has demonstrated outstanding leadership and judgment, and his contribution to the development of commerce and industry in Hong Kong has been particularly substantial. In 2000 Dr Tang received the Gold Bauhinia Star, and in 2002 the degree of Doctor of Business Administration, *honoris causa* from the Hong Kong Polytechnic University. In 2003 the City University of Hong Kong conferred on him the degree of Doctor of Laws, *honoris causa*, and in 2008 the Open University of Hong Kong conferred on him with the degree of Doctor of Social Sciences, *honoris causa*. In 2009, the Chief Executive of the Hong Kong Special Administrative Region presented him with the Grand Bauhinia Medal.

The contribution of Dr Tang to higher education in Hong Kong has been significant. He was a member of the University Grants Committee, at which time tertiary education had seen spectacular growth and expansion. Education has always occupied a high place on his governance agenda, and it is his view that, for Hong Kong to maintain its strategic advantages in regional and world economy, it is essential for the city to develop, as well as to absorb and retain, the best human resources. Apart from the enhancement of the training of local talent, this policy is to be materialized through the strengthening of exchange programmes and the provision of additional residence places in local tertiary institutions. It is anticipated that these measures will help to draw young people of high capability to Hong Kong, and to bring to early fruition the ultimate goal of developing Hong Kong into a regional educational hub.

Dr Tang and his family have been ardent supporters of The Chinese University of Hong Kong and its constituent Colleges over the decades. Dr Tang Hsiang-chien, the father of Dr Henry Tang, had been the Chairman of the Board of Trustees of New Asia College for many years, and he had also sat on the Board of Trustees of United College and the University Council. Following the stellar footsteps of his father, Dr Henry Tang was Vice-Chairman of the Board of Trustees of New Asia College, and he endowed the Henry Tang Scholarship for the students of the College. He spared no effort in facilitating the development of the College, establishing the mentorship programme for its students and launching the summer student exchange programme for social service between New Asia College and Yale University. From 1997 to 2007, Dr Tang generously donated full scholarships to students with outstanding academic achievements in the Faculties of Business Administration and Engineering.

On 18 September 2009, when speaking at a guest lecture at Shaw College, Dr Tang said, "The university is an august edifice at which academic research is pursued, and where human resources for the society are nurtured. Members of the Chinese University are people who cherish their ideals, who are endowed with foresight, and who practise the virtue of perseverance. Twenty years ago, when the Government required the Chinese University to change its academic structure from a four-year curriculum to a three-year curriculum, students and teachers stood firm on the ideals with which the University was founded, and peacefully but resolutely voiced their protest and dissatisfaction. Today we are going back from a three-



year system to a four-year system, and time has proven that the Chinese University was right." With these words, we know for sure that Dr Tang fully recognizes the educational principles we have upheld all along, and the achievements we have made.

As a tribute to his illustrious contribution to Hong Kong and his unswerving support for The Chinese University of Hong Kong over the decades, Mr Chancellor, may I present Dr Henry Tang Ying-yen for the award of the degree of Doctor of Laws, *honoris causa*.

Conferment of the Degree of Doctor of Science, *honoris causa* A Citation



Professor Roger Y. Tsien, AB, PhD, Nobel Laureate in Chemistry

One of the great advances in biological science in recent years has been the capacity of scientists to track many kinds of biochemical processes in living cells and in real time. Using a light microscope, they can observe when certain genes are activated or certain proteins expressed. Watching such molecular interactions inside cells enables the study of the birth and spread of cancer cells, for example, or the way in which the electrical pathways inside the brain interact. When some of us on this stage began studying science we did not dream that the observation of such processes was possible. But in the 1960s a jellyfish was found that glowed brightly in the dark, and scientists later began to extract the molecule that made that possible. It was called green fluorescent protein (or GFP), which was made into a robust tool to tag the processes I have just been talking about. The scientist who has done most to develop, refine and expand this powerful research technology is the man we are honoured to have standing before us this morning. He is Professor Roger Y Tsien, who in 2008 was awarded the Nobel Prize in Chemistry for his pioneering research and development work on GFP.

Professor Tsien was born in New York of Chinese parents. He studied at Harvard College and did his PhD at the University of Cambridge. Here he began working on dyes to track the generation of calcium within cells during neurotransmission. He gradually refined his dyes to give them greater selectivity and found a technique for introducing them into living cells without injection. After a post-doctoral fellowship at Cambridge, he searched for a position in the US and found one at the University of California at Berkeley. He describes in his Nobel autobiography the situation at Berkeley in 1981 when he took up his Assistant Professorship. The State of California was cutting funds to its university system, and Berkeley was in the midst of a financial crisis. Despite the slim budget for laboratory start-up, he managed to do some of his most important research and to publish some of his most seminal papers. However, for his work to flourish he needed a more favourable funding regime. He also needed a more flexible appointment in order to support his then unusual combination of work in chemistry and biology. He found these at the University of California at San Diego, where he received support from the Howard Hughes Medical Institute. He moved there in 1989 and has worked there ever since. It was here that much of his Nobel Prize winning work was done.

Professor Tsien was fortunate to grow up in a family that encouraged his scientific interests. His parents bought him a chemistry set, and when he outgrew this his father, an engineer, supported his passion by giving him more hazardous chemicals. His parents also allowed him to perform his experiments, some of them potentially quite dangerous, in the basement of the family home. The experiments were often extremely ambitious. There is a photograph in his Nobel autobiography of an improvised set of plastic containers, beakers and flasks designed, by way of an interlinked, multi-staged process, to synthesize an intermediate on the way to aspirin! It didn't succeed, but some of the stages were completed, and he evidently taught himself a



great deal of science in the process. The spirit of scientific inquiry had by then taken hold of his mind and imagination.

At the age of 15 he entered a National Science Foundation-sponsored summer research program at Ohio University. He describes the work he did there with amusing self-disparagement as preparing "a lot of amorphous precipitates of rather ill-defined composition" and measuring their infrared spectra. Later that year he entered the Westinghouse Science Talent Search, a nation-wide science competition. He used his summer school work despite his "dubious data" and eventually won the US\$10,000 first prize. "I am still mystified how I won first prize despite the unsoundness of my project," he writes, "and I retain a dislike for scientific competitions". Despite this feeling about such competitions, Professor Tsien's scientific career was in effect launched.

Following on from this early prize, Professor Tsien has won numerous awards and honours for his outstanding research. These include the Searle Scholar Award (1983), Young Scientist Award, Passano Foundation (1991), Artois-Baillet-Latour Health Prize (1995), Gairdner Foundation International Award (1995), Election to the US National Academy of Sciences (1998), Heineken Prize for Biochemistry and Biophysics (2002), Wolf Prize in Medicine, Israel (2004), election as Foreign Member of Royal Society of London (2006), and the E.B. Wilson Medal, American Society for Cell Biology (2008).

Professor Tsien is proud of his Chinese heritage. He writes that thirty-four generations ago his remote ancestor, Qian Liu, "established a kingdom around Hangzhou and fostered its growth through many civil engineering projects." More recently his father's cousin, the late Qian Xuesen was an aeronautical engineer who "became the father of the ballistic missile program of the People's Republic." Professor Tsien's father was also a mechanical engineer, who won a scholarship to the US to study at MIT. Professor Tsien's own skill in engineering the GFP molecule to produce a whole new palette of fluorescent proteins, with all the colours of the rainbow, may have something to do with genetic inheritance from a distant ancestor!

The Chinese University of Hong Kong delights in celebrating the truly remarkable achievements of people of Chinese descent. For this reason it is my privilege, Mr Chancellor, to present to you Professor Roger Y. Tsien, Nobel Laureate in Chemistry, for the award of the degree of Doctor of Science, *honoris causa*.

This citation is written by Professor David Parker