

Speech at the High-Table Dinner of the Summer Science Institute (for secondary school pupils) on July 28, 2005

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I am not an exemplar of the theme of this high-table dinner (Road to Success: HKU Science). However, I do feel immensely grateful for having spent 30 fulfilling years as a teacher in HKU. Apparently I am selected as a speaker because I am old enough to tell one story of the career of a science graduate of HKU.

I entered HKU in the autumn of 1963. The number 1963 is interesting. In fact, every number is interesting. Let me give a mathematical proof of this. Suppose there were numbers that are not interesting. Among them there is a smallest one. As the smallest number that is not interesting, it is in itself interesting! This is a contradiction. By the time-honoured technique in mathematics called *reductio ad absurdum*, all numbers are interesting.

Anyway, I became an undergraduate in Faculty of Science of HKU in 1963. Before entering HKU I did not have the good fortune like all of you to be able to participate in exciting events like SSI (or what the Dean refers to as “?!”). Such activities were nonexistent in our days. The nearest to such an activity that I experienced is participation in the making of a reflection telescope. In the summer after Form 5, the Astronomy Club of the HKUSU wrote to our school to say that they could provide guidance if any group of pupils would be interested in making a reflection telescope. I persuaded three more classmates to form a group and spent about two months to make the telescope from scratch. The hardest part is to grind the mirror out of a thick slab of porthole glass, then to silver it. But I learnt a lot and thoroughly enjoyed the experience.

From this anecdote you may sense that I liked science since schooldays. Actually I liked other school subjects as well. I guess what drove me more to science (likewise for many in my generation) is the impact of the award of the Nobel Prize in Physics to C.N. Yang and T.D. Lee in 1957. Instead of having pop singers as our idols, we had C.N. Yang and T.D. Lee as our idols in those good old days.

In my first year in HKU I studied in the physical stream. I took all three subjects --- chemistry, mathematics, and physics. In the second and third years we selected two subjects out of the three, and I selected mathematics and physics. Again, I did not have the good fortune like all of you today to get a wide exposure in science. My knowledge in biology went as far as the level of Form 5, and no more biology after that. I learnt a bit more by myself through reading a popular science booklet in genetics during my first year. Molecular biology was starting to get exciting in those days, but I missed it all, mainly because the word “interdisciplinary” was not as common as it became two decades later. You are today much more fortunate in this, and you should grasp this excellent opportunity to learn more when you are young.

One more anecdote I can tell you is how I combined my knowledge in mathematics and physics in my student days. The Science Society of HKUSU held their Silver Jubilee Science Exhibition in the winter of 1965. I was assigned to work in the mathematics section. I wanted to devise an exhibit to illustrate the working of the binary number system. Mind you, in the HK of 1965 computer was still something on the pages of an advanced textbook only. Today you won't find it strange to have $1 + 1 = 10$. In our days this was a strange thing to imagine and to understand. I decided to make a gadget with glasses placed on several levels and make use of the principle of syphon to simulate the addition of binary numbers. I requested a very experienced technician in the chemistry lab, Master Lam, who was an expert in blowing glass, to make the set for me. It worked very nicely in the Science Exhibition.

At first my intention was to pursue further study in theoretical physics, hoping to follow in the footsteps of C.N. Yang and T.D. Lee. After the degree examination I had to make up my mind on what to do next. The practice of Department of Physics in those days was to invite students doing well in the final examination in physics to enrol in the BSc Special Year in physics. I was invited to appear before the imposing Professor Chesterman, Head of Physics. Before going I turned over this matter in my mind for days. One question I asked myself helped me to decide. One day I asked myself, “What is energy?” I knew the potential energy is $m \cdot g \cdot h$; I knew the kinetic energy is $(1/2) \cdot m \cdot v \cdot v$; I even knew the principle of conservation of energy. But I did not really understand what energy is! Then it occurred to me that I seemed to understand the concept simply because I could work with it thorough the mathematics in it. I further found out that many times I liked the physics because I liked the mathematics that goes with it. I understood the mathematics, but I lacked the feeling in physics! That ended

my dream of becoming another C.N. Yang or T.D. Lee. A few days later when I appeared before Professor Chesterman, I told him, “I will not enrol in BSc Special in physics. Not that I love physics less, but I love mathematics more.”

I think I made a right choice for myself. However, I am also thankful for the three years of physics I had done, for it helped me to broaden my vista of mathematics. After getting my BSc Special degree in mathematics, I went to Columbia University to do graduate study in mathematics.

I mentioned T.D. Lee at the beginning. I like to end my speech by mentioning him again. As I said, he is one of our idols in those days, some luminary on high and far beyond reach. However, once in Columbia University, whenever I went to Pupin Laboratory to look up my fellow graduate students in physics, it was not unusual to find either Professor T.D. Lee or Madam C.S. Wu, both of the non-conservation of parity fame, standing next to me in the lift. At that close range they look just like any ordinary person. What make them great scientists of world stature are their diligence, determination, dedication, concentrated effort and high aspiration. At this point in time you may look like just any ordinary lively youngster, but with those attributes you can one day reach that same height and beyond. Best wishes to your future endeavour!