

Haihan's Reflections on the
**Stockholm International Youth
Science Seminar 2003**

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Imperial College Alumni Association of Singapore

and

World Scientific Book Publishing Co. Pte. Ltd.

Day 1 051203 Friday

After a long and horrid trip from Singapore to Arlanda Airport in Stockholm through Bangkok on Thai Airways, I finally arrived at the Youth Hostel, Af Chapman / Skeppsholmen, at 0900h this morning. I had actually been scheduled to arrive at the same time 24h ago, but a torrid delay on the Singapore – Bangkok leg of the flight had condemned me to miss the connecting flight to Stockholm and left me hanging in the Bangkok airport hotel for a full day. As a result, I had missed the Welcome Dinner the night before, so it was with a bit of trepidation that I knocked on the door of my room in the hostel, not knowing who I would be bunking with. It turned out that the room would be shared by Wim (Netherlands), Ralph (Germany) and Thomas (Denmark), otherwise known as our resident beer guzzler, and that they were all very nice people.

After a bit of unpacking, all 23 of us participants were bundled off to Riksdägen, or the Swedish parliament, to sneak a peek at the Swedish democratic system and the parliamentary building. Through an initial guided tour of the Riksdägen, I found out that the Swedish Parliament consists of only one chamber, unlike some other European parliaments, and that the royalty is just a figurehead and a symbol without any true governing authority. I was well impressed by the facts that 47% of the Parliament was made up of females and that the Green Party had a 19 year old as an MP. And I was left wondering if there was such participation of youth in politics in Sweden, should the Swedish system be used as a model for solving political apathy among Singapore youths.

Lunch was up next, at a nearby café, where I got to know Luke, Jin and Helena better after interacting with them throughout the meal. More political agenda lay up ahead as we met with the Vice-Speaker of the Parliament, Helena Höij, for a more lively discussion session on the roles of the Speakers of Parliament and the Parliament itself. There was one point raised during this interesting session that caught my attention. Should we as scientists, be like Linus Pauling,

who pulled out of the Manhattan Project to fight for what he believed was important to safeguarding world peace? Should we as scientists, be open and allow for legislators to approach us for expert opinions, and is that considered a form of national duty?

We visited the royal palace after that and got a few myths corrected. The Swedish palace is the oldest and largest palace in Europe, not Buckingham Palace in England, as some might tend to think. After being brought through a condensed history of the palace and the royal family, we toured the King's and Queen's wings and found the rooms bedecked in lavish red and gold colourations and splendid crystal chandeliers that illuminated portraits of previous kings and queens on the four walls of the many rooms. There couldn't be a more wonderful setting for most of the official receptions given by his Majesty the King to visiting Heads of States or ambassadors.

Because the SIYSS participants are all guests of the Nobel Foundation, we were invited to the Nobel Museum next, where we were given a talk by the Chairman of the Royal Swedish Academy (which incidentally decides on the Physics and Chemistry laureates!) about Alfred Nobel, his life, his work and his will. We were no doubt very enlightened by the talk about the whole business of the Nobel prizes. Dinner was at another cosy café. I was still trying to get used to Swedish food: potatoes and so much meat! On another note, it started to snow after dinner. And the snow was not the powdery type, but came in big feathery clumps, that I thought was really nice!

Overall, it was a good first day, considering that I had arrived in a dazed rush. The other participants were quite nice, but I found that many were initially unwilling to emerge from a barrier they had erected around themselves. I was lucky in the sense that I got to know Luke and Courtney slightly before the trip through the email contact that we had made. The next few days would turn out to be great, as I was soon to find out.

Day 2 061203 Saturday

A day out in Uppsala, the university town of Sweden north of Stockholm, where 2 major universities call home! The snow drifts were relentless as we travelled by coach, and upon arrival, we were greeted by an ankle-thick field of white. Snowball wars inevitably erupted between Nigel, Helena and Thomas, but it was all in the name of good fun! The first stop was the mounds of Uppsala, where the ancient Viking kings Egil, Ane and Adils were rumoured to have been buried. It was very cold today with the winds coming at us strongly, so we didn't stay out in the open for too long. And falling down as I was going down an icy slope didn't help much as well, but it was nice to see snow eventually. Our guide then led us to the old cathedral in town, where we paid homage to the tombs of several notable kings and professors in Uppsala University. In particular, I bowed my head in respect to the tombstone of Carolus Linnaeus, or Carl von Linné, the father of the binomial system of taxonomy, as well as the inspiration of my love for biology, and the man without whom my project would not have been possible!

It was at the Museum Gustavianum next, that I learned more about Linnaeus than I had ever known. First, we had a peek at Olof Rudbeck, a great man to have emerged from Uppsala! He was a professor of Uppsala University who was a naturalist, professor of medicine, economics and philosophy, chemist, harbourmaster, architect of Stockholm / Uppsala, and to top it all up, the head of the fire brigade! Now, how multi-talented can that get?! Then I finally had my dose of Linnaeus, and I learned about the good and the bad sides to him. He, of course, had introduced the universal Latin binomial system of classification that we are so familiar with nowadays, and first mooted the idea of introducing a certain order into the natural world. However, he was a professor who stole contemporaries' ideas (eg. he published manuscripts of fish taxonomy of a friend who had passed away and claimed sole authorship of them), who took advantage of students by sending them off to far-flung places around the world and requesting that they send back specimens which he then pilfered as his own (many of these students died on the dangerous

trips), and was immensely narcissistic (more than 250 portraits of himself!). On hindsight, it seems like he was an unlikeable guy, but I suppose all great men are eccentric in some way or another. It was just another interesting facet of Linnaeus to know.

After lunch, we met Kai Siegbahn, the Physics laureate of 1981, and his staff members at the Physics Department of Uppsala University. I didn't understand the Raman scatter analyses that they were talking about, but I think I could roughly get an idea of the diffraction and the spectrometry work that they were doing. Great inspirations lay in store for me when we split into small groups to be taken by each of his staff members. I happened to be brought around by a professor who was immensely fascinated by the work he is doing. He exhorted the few of us to think unorthodox and change the rules as we strike out into the unknown in frontier sciences. Are we a finite player in the game of research, or shall we be infinite players who can come out winners all the time (ie. gain knowledge beyond what we know as conventional at present)? To illustrate, he gave the example of working with atomic monolayers at phase transition. What would happen to the monolayer at the critical temperature? Would it freeze, or would it not? And to end off, he gave a fitting quote. I quote, "It gets quite f***ing boring if you sit around thinking in the same box day in and day out." That's true, and that applies to biology as well!

We had a while to walk around the sleepy little town before the coordinators brought us to Östgöta Nation for a mock Nobel Banquet rehearsal dinner, where we were taught the etiquette of fine dining, table manners and ballroom dancing (foxtrot). It was a very interesting session, to say the least, and I found many facets of dining etiquette refreshingly interesting, for example the art of toasting, the responsibility of entertaining your dinner partner (for gentlemen, the lady to the right is one's dinner partner), and no less the art of dancing foxtrot. Although the dinner ended late at 2300h, one wishes that it could have lasted just that little bit longer, for it was an invaluable opportunity to interact with others sitting around me, like Marek, Seraina and Emily.

Day 3 071203 Sunday

The Nobel Press Conference for Physiology / Medicine was held today at the Karolinska Institutet (KI), possibly the most famous medical institute in Sweden, in the suburbs of Stockholm, so we reached there early in the morning to tour the facilities of KI. Meeting up with the Secretary of the Nobel Assembly at KI, we were given a talk about KI and the process of awarding the Prize for Physiology / Medicine. Essentially, the process can be split into 4 components: Discovery, Nomination, Investigation and Voting. A novel discovery of the physiological process or application will be followed by nomination of the appropriate researcher by invited nominators or other nominators who are deemed suitable, then an investigation of the work by invited investigators, and finally a voting process by all 50 members of the KI Nobel Assembly. The paperwork and all administrative manuscripts will be kept confidential for 50 years after the Prize has been awarded, to prevent any foul play by anyone. We also got to know how the Assembly deals with tricky situations that arise.

We were interrupted halfway through a vibrant Q&A session as we had to attend the Press Conference with the 2 Physiology / Medicine laureates: Prof Paul Lauterbur and Sir Peter Mansfield, who were awarded for their work in the discovery and development of Magnetic Resonance Imaging (MRI), that is now routinely used in hospitals for non-invasive scanning of internal organs. Besides the press representatives and the laureates' relatives, the only other people present were us SIYSS participants, so our coordinators had asked us to prepare to ask intellectual questions beforehand, since the press had not asked such questions from past experience. And true to prediction, the press did not have many scientific questions in mind, and it was indeed up to us to pose more intellectually-challenging questions. Personally, I asked the question of whether there would be a possibility of making real time scans of organs, and found that in fact current technology permits 10 scans a second, which is in itself quite real time. The Nuclear Magnetic Resonance (NMR) that I had learned in my JC syllabus proved a great help in

understanding the concept of MRI, since both possess similar fundamental concepts. As a side note, I thought that Sir Mansfield was quite distant and even confrontational at times when answering, while Prof Lauterbur was more forthcoming, but I don't think I am in a position to judge as such.

A short visit to the KI Hospital Computer Tomography (CT) and MRI unit ensued, where we were shown the strikingly surreal images, both 2D and 3D, that can be formed by CT or MRI. The 3D images were especially fantastic, since they can be used to track blood flow in blood vessels, or even fluid flow in the axons of neurons. That is something I will definitely keep in mind if I do embark on neuronal research in the future!

Interestingly, we popped into a Mongolian / Chinese restaurant for dinner, and it was a nice feeling to be able to use chopsticks in a foreign country where one does not usually see them. Nigel, Kanami and I tried to teach Wim how to use them, with limited success, I must admit, but it was a good feeling to have seen this sort of cross-cultural exchange taking place. I gave the Nobel Lecture in Literature a miss as there were limited places, and walked around a few Julmarknad (Christmas market) in town, picking up Glögg (traditional warm Swedish Christmas wine) and Pepparkaka along the way. There was a warm Christmas atmosphere as the few of us who were walking around gathered in front of the stall to drink the wine, standing on snow-covered streets, clad in full winter apparel and warming our hands with the hot mug.

The one last item on our agenda for today was a visit to the Swedish Royal Academy of Science (RSA). Being very tired already, we sat through the introduction to the history of RSA in a daze, while trying to pick up as much nuggets of information as we could, then heaved ourselves over to the RSA Library where I found more books on Carolus Linnaeus! That woke me up! It was a very tired group of participants who returned to the hostel this night.

Day 4 081203 Monday

Today was another long day, chock full of lectures and lectures one after another. The purpose of these lectures were to allow the laureates a chance to present to students their work and hopefully inspire some bright young minds to make the next big breakthrough. It all began with the Nobel Lectures in Physics, where each of the 3 laureates gave a 45 minute presentation each. I have to admit, I couldn't comprehend exactly what they were talking about since their research seemed to involve much high level Mathematics that I am very poor at, but it was good to just sit in and listen to the theories of superconductivity and superfluidity being thrown up. One of the laureates, Prof Vitaly Ginzburg, even used his lecture to exhort other researchers to follow up in superconductivity research as he worries that it might be a dying field. I quote him, "[we must] take a broad view of Science... against a narrow view... such is the force of fashion in Science, too..." It was yet another exhortation to take an unorthodox pathway in research.

The Chemistry Lectures were next up, and they were what I had been looking forward to all day long. And the 2 laureates did not disappoint me! It would be unsuitable for me to type out all the lecture notes that I made as I listened to the lectures, as I would continue on without stopping, but in a nutshell, both laureates' research concentrated on the mechanistic studies of ion channels and the discovery of water pores (aquaporins) respectively. It was Biochemistry, and it was beautiful to see how they had actually elucidated the presence and the workings of the ion channels! I was impressed by Prof Roderick Mackinnon's words, "I have prepared my talk for the most important people in the audience – the students" True to his word, he tried to keep his presentation as simple as possible for the sake of students in the audience who were not Biology students, and I thought that it was very considerate of him.

Coming out of the Chemistry Lectures, we were whisked off to KI once again, this time for the Physiology / Medicine Lectures. By then, we were just about drained, and we could hardly

keep awake. Nevertheless, we still did, and although the Medicine Lectures were not too relevant to us, the opportunity to attend it was simply great exposure for us!

The gentlemen in the group went to make measurements for our tails after the Lectures had ended, before everyone met back in the hostel for the coach to bring us to Café Zénit at the Royal Technological University for the get-together party, which was essentially a time for us to perform cultural items and to have more fun! With the many presents that were being passed around and the different items ranging from ridiculous to heartwarming, it was a great night; one that would stick around in our memories in the times to come.

Day 5 091203 Tuesday

Our second last day in Stockholm opened with a visit to the Royal Palace to meet and greet Crown Princess Victoria and Prince Carl-Philip. A short lesson on the proper decorum when meeting them was followed immediately by an audience in one of the rooms with them. I was pleasantly surprised to see that their Royal Highnesses, decked in smart pantsuits, were down-to-Earth and could actually relate to us well. In a blaze of flashes from the cameras of the palace photographers, their Royal Highnesses went around the semicircle that we had formed to shake our hands and let us introduce ourselves. Then Anders stepped forward to introduce SIYSS and thank their Royal Highnesses for the audience. Time was running short, but a lucky group of 4 – Anila, Emily, Anant and myself – had the opportunity to present our research to them! It was a wonderful feeling to have Crown Princess Victoria commenting that it was great to see young researchers embarking on work in the spirit of Linnaeus!

Before long, we had to move on to the Tekniska Muséet for our Science Seminar actual! As the coach pulled up at the entrance of the museum, I saw the many high school students gathered to witness our seminar and found it was a strange feeling to be presenting our research, in formal attire no less, to youths of similar age clad in casual clothing. The presentations flowed

smoothly for the rest of the day, with little interruption and questions of a commendable standard coming from the floor after each 8 minute presentation. One regret was that many of us were unable to allow the audience to gain further insight by introducing the background knowledge and the possible implications of our findings due to the 8 minute constraint that had been imposed on us due to the shortage of time. Nevertheless, it was good to hear what others had researched on; after all, this seminar is what SIYSS is named after! Hopefully, we will keep in touch after SIYSS, and since we know where one another's research passions and interests lie, it might just be possible for future international collaboration.

A quick dinner followed, then a hurried change of clothes, before we were all driven to the Nordic Museum for the Nobel Foundation's reception, which we had been invited to. This first truly "magnificent" event of the Nobel week was a cocktail reception where the Nobel laureates and representatives from prominent Swedish academic institutions were invited to socialise and mingle for an evening. After passing through a tight security barrier, I was deeply impressed by the hall in which the reception was held. As I had never attended this sort of black-tie event before, I had only seen such settings in movies; it was definitely a first for me! Breaking up into small groups, the SIYSS participants mingled with the laureates (which was in fact quite difficult, as we had to take our chances well to get to speak with them) while sipping exquisite champagne and cocktails. I, for one, was eager to meet Prof Roderick Mackinnon, and finally did have a chance. The ensuing intellectual discussion with him was marvellous as we talked about topics ranging from ion channels to solvent drag to kidney physiology to youth research! I had a great time!

Day 6 101203 Wednesday

And this was it. This was The Day that everyone – participant or coordinator – had been eagerly anticipating. The actual Nobel ceremonies were held today in Stockholm, birthplace of Alfred Nobel.

As there was a morning of free time, I passed time by taking a walk around the city centre with a few other friends and having lunch in town. Before we knew it, the clock had struck 12 noon, and we had to return to the hostel to get changed and washed up for the big event later on. Back in my room, upon opening up the suitcase that I had been given, I was stunned at the array of formal attire within. Wim, Ralph and I stared in disbelief at the lapel pins, bow tie, shirt, vest, suspenders, pants and tails; we had not a clue of how to put them on! Luckily, Thomas saved the day by taking us through it step by step, yet I still needed a good 20 minutes to struggle with the tails. It was all worth it, however, as I thought we looked rather good in tails! At 1400h, the lobby was a sight to behold. 28 youths had gathered there, in the most formal of dinner wear and in the most unlikely of places, frantically trying to take photographs of one another! A very pleasant surprise was in store for all of us as 5 white limousines pulled up in front of the hostel to chauffeur us to the Stockholm Konserthuset (Concert Hall) for the Nobel Prize Awarding Ceremony. It was all so grand, so posh!

Words cannot do justice to the events that I had witnessed that afternoon and evening, so I shall suffice with a feeble attempt to describe the proceedings of the events. At the Ceremony, the laureates all received their prizes from his Majesty the King Carl XVI Gustaf in a solemn setting interspersed with classical movements and operas by the Royal Stockholm Philharmonic Orchestra. Since cameras were not allowed in the Konserthuset, I was trying hard to remember every single detail of what my eyes saw! I felt like I was in a surreal pipe dream, and I didn't want to wake up at all.

The pipe dream continued with the Nobel Banquet and the Nobel Ball in the Stockholm City Hall. The Banquet, where guests dined and wined in luxurious settings, took place in the Blue Hall, was accompanied by holographic projections, jazz band performances and short speeches by the laureates. In particular, I was touched when the Literature laureate Prof J.M. Coetzee dedicated his prize to his mother (and through that, dedicated our lives to our parents) and when the Chemistry laureate Prof Peter Agre took the opportunity to thank all our teachers, who are instrumental in helping us to develop. It was something that I had never dreamed of before; it was just wonderful! And a Swedish custom that the SIYSS participants took full advantage of was the custom of toasting, or skälling, in the more varied Swedish vocabulary. How pleasant it was to look each other in the eye as we toasted, sipped and toasted again! Good food, good music, good ambience and good company. What a Banquet, what a Banquet!

As if that was not enough, the Ball was held in the Golden Room after the Banquet, and we all danced – ballroom dancing or Latin dancing – on a wonderful dance floor with a live band playing great music. I was still in the pipe dream, and enjoying every second of it! At midnight, we removed ourselves from the dance floor to pop down to the Universitet Stockholm, which hosted the Nobel Nightcap, or after-party, this year. More drinks, more mingling, and more dancing was the order of the day. Tired or dishevelled we might have been upon returning to the hostel in the early hours of the morning, but it was without a doubt that we all had the time of our lives!

And finally...

The teary goodbyes and big bear hugs aside, returning to our home countries after the Nobel week and SIYSS was always going to be quite difficult. The Seminar had not just brought aspiring scientists together for lively discussion, but had also placed the discussion in a very inspiring context of the Nobel week of 2003. As a result, many, if not all, of us, gained so much

understanding into fields of science that we had never delved into before, and more importantly, we were so greatly inspired by the anecdotes that all the laureates and the scientists whom we had met had said to us. Add that to the very firm friendships that we had forged among ourselves (although it might have been a short 7 days, the small number of participants meant that we did get to know each other better than we had expected), and I can only say that the Seminar was a huge success!

Few trips can warrant the description of being life-changing. This is one that indeed was.

Acknowledgements

I would like to thank the Imperial College Alumni Association of Singapore and World Scientific Book Publishing Co. Pte. Ltd. for sponsoring me and allowing me to embark on such a journey that has impacted my life greatly. My deepest gratitude to them. I would also like to thank my parents, for their care and understanding while I was away, and for calming my nerves tremendously during the problems with the flights to and fro Stockholm. Finally, a last word of gratitude goes to Ms. Wendy Toh of World Scientific, who had performed all the administrative duties of securing the air tickets, liaising with the SIYSS coordinators, and put up with all my idiosyncrasies and delays. Thank you.

Memories



Af Chapman, the youth hostel where we stayed at



A white Christmas... Maybe... At Uppsala



Me with Prof Paul Lauterbur, Physiology / Medicine laureate



The ladies, just before the Nobel Prize Awarding Ceremony



And the gentlemen...