

# 21

## Prizes

One winter's day in 1972, Liebe had a phone call from Aaron. In bemused tones, he said, 'I've been awarded something called the Heineken Prize. I don't know what it is, or who nominated me.' Liebe passed on the good news to David, who was somewhat incredulous. How could his dad, who mostly appeared rather vague, possibly get an award? Apparently Aaron's work and achievements had never encroached on family life.

More information soon arrived. Alfred Heineken had created the first Heineken Prize in honour of his father Henri Pierre Heineken, who was a biochemist. The first prize in 1964 was awarded to Erwin Chargaff, renowned for discoveries concerning base ratios in DNA. Alfred Henry 'Freddy' Heineken was for many years the CEO of the Heineken International Brewing Company, founded in 1864 by his grandfather. At the time of his death in 2002, Freddy Heineken was one of the richest people in the Netherlands.

In the spring of 1973, Aaron visited Holland for a week to give lectures at all the major universities. He talked about his work on tobacco mosaic virus assembly. At the end of the week, Prince Claus of the Netherlands presented the prize in a ceremony at the Beurs van Berlage in Amsterdam. Aaron was put up in the Grand Hotel, a splendid Art Deco building. As a tangible representation of the prize Aaron was presented with a reproduction of Leeuwenhoek's

microscope, mounted on a large glass crystal. At the Grand Dinner, Freddy Heineken was in a jolly mood. He was intrigued by the question:

*What Motivates Mankind?*

Prize winners were expected to respond to this question. Aaron's answer was characteristically uncomplicated:

*What motivates Mankind is survival. Once survival has been assured, curiosity is the most motivating force.*

In September 1981, the Klugs were at a Summer School in Spetsai, an island in the Peloponnese favoured as a yacht harbour by rich Athenians and for package holidays by the British. Aaron and Liebe had attended this School every summer for five years in a row. The subject of this summer's meeting was 'Control and Processing in the Biosynthesis of Macromolecules', co-organised by Brian Clarke and Hermann Bujard. Aaron presented a paper on the structure of chromatin. During



**Figure 21.1** Liebe, Aaron and Prince Claus of the Netherlands at the Award of the Heineken Prize to Aaron on 15th April 1973 in the Beurs van Berlage, Amsterdam. (© MRC Laboratory of Molecular Biology.)

the meeting, a phone call came through from Jenny Brightwell, secretary to the Structural Studies Division of LMB, to tell Aaron that he had been awarded the Louisa Gross Horwitz prize.

The Louisa Gross Horwitz Prize was established under the will of the late S. Gross Horwitz through a bequest to Columbia University, and is named to honour the donor's mother. Each year, since its inception in 1967, the prize has been awarded by Columbia University for outstanding basic research in the fields of biology or biochemistry. Ten years previously, the Louisa Gross Horwitz Prize had been awarded to Hugh Huxley. In 1980, before Aaron's award, it had been given to César Milstein, Head of the Protein and Nucleic Acid Chemistry Division of the LMB. In 2008, the prize was awarded posthumously to Rosalind Franklin.

Thus, in November 1981, the Klugs set off for New York. They stayed at the Plaza Hotel on the corner of Fifth Avenue and 59th Street in a suite on the 15th floor overlooking the Park. The presentation was at Columbia University followed by a dinner in the library. Aaron's student friends, Vivian Rakoff, Ralph Hirschowitz, Bennie Kaminer and Freda Kaminer, Norman Podhoretz and Midge Decter, all came along. For the occasion, Aaron had visited his trusted outfitters on Cherry Hinton Road in Cambridge and bought himself a pair of new black shoes, but without trying them on. It turned out that they were far too small. Fortunately, Aaron was able to borrow a pair from Norman Podhoretz. When the presentation and formal dinner were over, the Klugs and friends retired to the Plaza, which with its 'Great Gatsby' ambience seemed appropriately decadent for strawberries and cream. The Klugs subsequently stayed for a few more days with the Podhoretzes, in their elegant flat on the West Side.

The Louisa Gross Horowitz Prize is often cited as the harbinger of a Nobel Prize, and so indeed it was. On Monday 11th October 1982, Aaron phoned Liebe at home. He reported that he had had a phone call from Stockholm. The caller had said, 'Are you sitting down?' before telling Aaron that he had won the Nobel Prize in Chemistry. When Liebe asked Aaron with whom, he replied, 'On my own!'

This was the sixth Nobel Prize awarded to a member of the LMB. The news came during the week of the LMB talks, which had been instigated in the 1960s by Francis Crick to help Perutz (as Chairman and *de jure* Director) keep abreast of what was going on in the laboratory.

They had become an important part of the LMB tradition, and Aaron was loath to disrupt them. Nevertheless, the word quickly spread through the lecture theatre, whereupon the atmosphere brightened. A reporter from the *London Times* phoned up for details and happened to get hold of Sydney Brenner. Having asked Brenner all the standard things about the science and its significance, he tentatively asked Brenner, 'Is he British?' to which Brenner replied in his broadest South African, 'He's as British as I am!'

Then the mail began to arrive, piles and piles of it. Instructions arrived from Stockholm, including a list of what clothes one would have to wear (Vivien Perutz told Liebe that Perutz had had to arrange an overdraft to pay for the family's Nobel outfits) followed by a celebratory lunch at Peterhouse hosted by the Swedish ambassador. The press came – of all kinds and from all manner of places – to a degree that Aaron found overwhelming. He tried to continue working but never got round to writing his Nobel Lecture, which he actually sketched out in Stockholm on the night before the lecture.

The Klugs arrived in Stockholm with seven suitcases. They were met at the airport with flowers, photographers and journalists and conveyed to the Grand Hotel, flames leaping from the pediment displaying the flags of all nations. The Swedish Krona had just been devalued so that the prize was not quite as valuable as it might have been. As a small recompense, the speaker of the Riksdag arranged for a bicycle to be presented to Aaron, it being well known that Aaron generally rode a bike to the lab. Unfortunately, it was a racing bike, not quite Aaron's style. In the end Aaron gave it to David, who used it a lot in London.

A Nobel Laureate is expected to give a summary of his or her work at the Nobel Lecture two days before the prize-giving. Aaron's Nobel Lecture was held in the Beijer Hall of the Swedish Academy of Sciences in the afternoon on 8th December. He was introduced by Bo G. Malmström from Göteborg, chairman of the Chemistry committee at that time. Since Aaron had not managed to write his lecture, he spoke unscripted (this is fairly common for scientific lectures where speakers tend to rely on the sequence of slides as a prompt). He described the work on tobacco mosaic virus, TMV, which had been started with Rosalind Franklin, and he could not help surmising that she would have been sharing the podium had she had not died so young. He recounted how a combination of crystallography, chemistry and

electron microscopy had led to a detailed understanding of the structure and function of this simple virus. He then described the work with David DeRosier that had led to 3D reconstructions of structures from electron micrograph images, and explained how mathematical manipulations of the image could remove the effects of underfocus in electron micrographs. He finally showed how the approach that had been developed for TMV could be successful in unravelling the structure of chromatin, the storage form of DNA in the nucleus, which at the beginning had appeared to be an intractable problem. In the written form of his lecture<sup>1</sup> Aaron concluded with these remarks:

*I particularly wanted to outline the chromatin work because it may serve as a contemporary paradigm for structural studies which try to connect the cellular and the molecular. One studies a complex system by dissecting it out physically, chemically, or in this case enzymatically, and then tries to obtain a detailed picture of its parts by X-ray analysis and chemical studies, and an overall picture of the intact assembly by electron microscopy. There is, however, a sense in which viruses and chromatin, which I have described in this lecture, are still relatively simple systems. Much more complex systems, ribosomes, the mitotic apparatus, lie before us and future generations will recognise that their study is a formidable task, in some respects only just begun. I am glad to have had a hand in the beginnings of the foundation of structural molecular biology.*

The literature prize for 1982 went to the Columbian novelist Gabriel García Márquez. Aaron would very much have liked to hear Márquez's impassioned speech calling for an end of 100 years of South American solitude. However, since it overlapped with his own speech (and was in Spanish), he had to be content with the printed version. Márquez's humanitarian views commended themselves highly to Aaron.

The Nobel Foundation invites members of the family to participate in the jollifications. Thus Aaron's brother Bennie, sister Robin, David, Adam and his wife Debbie, and Aaron's cousins from Cleveland accompanied Aaron and Liebe to Stockholm. The ceremony is held on 10th

<sup>1</sup> 'Aaron Klug – Nobel Lecture: From Macromolecules to Biological Assemblies'. *Nobelprize.org*. Nobel Media AB 2013. [http://www.nobelprize.org/nobel\\_prizes/chemistry/laureates/1982/klug-lecture.html](http://www.nobelprize.org/nobel_prizes/chemistry/laureates/1982/klug-lecture.html)

December (the anniversary of Alfred Nobel's death). It starts with a rehearsal in the morning, followed by time to get into the finery, then off to the Stockholm Concert Hall. The King presents each Laureate with the Gold Medal of the Royal Swedish Academy of Sciences (Plate 8) and leather-bound folder containing the prize citation.

The subsequent Nobel Banquet, which is held in Stockholm City Hall, is opened by the King who proposes the toast of Alfred Nobel. During the meal, each Nobel Laureate goes to the top of the staircase to give an expression of thanks for the recognition of his work.

Aaron eloquently praised the prize<sup>2</sup>:

*Your Majesties, Your Royal Highnesses, Your Excellencies, Ladies and Gentlemen, I wish to express my profound gratitude for the distinction with which you have honoured me today. Ever since I heard the news of the Royal Swedish Academy's decision, and even since arriving in Stockholm, with its flags flying and flames leaping, I have not been able to shake off a feeling of unreality. It is as though I have been cast as an actor invited to take part in a production and not quite knowing his lines. But, the ceremony today, the dignity of the proceedings, the magnificence of the surroundings, this glittering company, have made it all real. Moreover, the formality of this great occasion is combined with a friendliness and a hospitality which makes it delightfully easy to take part.*

*I am deeply conscious that though the Prize has been awarded to me, it is a Prize also to my field of the study of biological machinery. This field is not necessarily glamorous, nor does it often produce immediate results, but it seeks to increase our basic understanding of living processes. The work requires a moderately large investment in technological and theoretical developments and long periods of time to carry them out, without the pressure to achieve quick or short term results. This is, of course, in the gift of our fellow citizens and we very much appreciate the freedom to follow our instincts and to try to solve what we think can be solved.*

*People often ask what is the use of it. In a world where there are pressing problems, why doesn't one devote one's efforts to the practical*

<sup>2</sup> 'Aaron Klug – Banquet Speech'. *Nobelprize.org*. Nobel Media AB 2013.

<[http://www.nobelprize.org/nobel\\_prizes/chemistry/laureates/1982/klug-speech.html](http://www.nobelprize.org/nobel_prizes/chemistry/laureates/1982/klug-speech.html)>

*benefits of mankind. I need only recall the answer of the great Michael Faraday, when at a public lecture he was demonstrating the production of electricity. 'Of what use is your invention, Mr. Faraday?' demanded an important lady. 'Madam', he replied, 'of what use is a new born child?' If – quoting freely from François Jacob – basic science has emerged from its original, and perhaps necessary, obscurity, if the public at large has come to understand its role in the evolution of our culture and society, then this is a large part due to the manner in which you, in this country of Sweden, have interpreted and realized the will of Alfred Nobel. By their independence, by their rigorous work, the Nobel Committees have given the Prize a unique position and prestige.*

*The Prize has not only marked discoveries of obvious benefit to mankind, but it has also set standards of excellence in fundamental work, which may bear fruit only in the distant future. In these days, when there are constant calls for research devoted to particular ends – and, I do not wish to minimize the importance of these policies – yet there should always be left room for apparently unguided research on problems that seem to have no practical application at the time. One cannot plan for the unexpected. Human curiosity, the urge to know, is a powerful force and is perhaps the best secret weapon of all in the struggle to unravel the workings of the natural world.*

*It is the celebration of this spirit which, I think, formed part of the intention of Alfred Nobel and of the significance of the Prizes he has created. I am privileged and honoured to have been included. For this day, for this night, I thank you all.*

In the old Julian calendar, 13th December was the Winter Solstice, which in dark northern Europe is a serious reason for a celebration with lights. Somehow this pagan festival of lights was transformed into Saint Lucia's Day. The Nobel guests were warned that they would be awakened on that day by singing maidens clad in white with red sashes and crowned with candles, bearing coffee and cinnamon cakes. David was particularly enthusiastic about this happening. What had not been said was that the maidens would be accompanied by a television crew and photographers. That evening, the Laureates joined the students at the Saint Lucia Ball where the literature Laureate, Gabriel García Márquez, crowned Santa Lucia. The Laureates were expected to take part in various charades and games. Aaron did something incorrectly and was awarded the Order of the Frog, of which he was duly proud.

In March 1983, Aaron was awarded the Chancellors Gold Medal of Merit by the University of Cape Town. The two previous recipients of this award were Allan Cormack and Chris Barnard, who performed the first heart transplant. The award was presented by the Vice Chancellor, Stuart Sanders. Sanders had become Vice Chancellor two years before and remained in that post for another 23 years. Aaron and Liebe became firm friends of Sanders and his wife Anita. During this turbulent time, in opposition to official policy, the University of Cape Town, under Sanders' leadership, embarked on a successful programme of recruiting black students. In addition to constant legal battles and police harassment, there was also the problem of financing such students. In 1990, Aaron became a trustee and later chairman of the University of Cape Town Trust in England. On his retirement from the chairmanship in 2010, at a ceremony in London, Aaron was awarded the Vice-Chancellor's Medal (Plate 9). During his 17 years as chairman, the Trust had raised £17 million mostly used for the support of black and mixed-race students at the University of Cape Town.

After the award in 1983, Aaron flew to Durban to visit his old school, Durban High School, that he had left in 1941. There was one main prize at the end of the school year for the most highly regarded student, called the Dux (Plate 10). Aaron had finished school during the Second World War when the custom of awarding prizes was held in abeyance. Now, some 40 years later, Aaron was awarded his Dux. After the ceremony, the boys were asked to write an essay about his visit. One 13-year-old wrote: 'Aaron Klug visited us and told us about his work. He got the novel prize for *genital engineering*.'

The next day, Aaron was entertained to dinner in the Durban Jewish club, where he and Bennie had played tennis and their father Lazar had enjoyed playing the card game *Klüberjass*.

In 1985, Aaron was awarded the Copley Medal of the Royal Society and thereby joined a phalanx of great eminence. This is the oldest and most prestigious Royal Society medal, having first been given in 1731 for 'outstanding achievements in research in any branch of science'. At the Anniversary meeting on 30th November, Aaron received the award from the Biological Secretary, David Smith. The citation read:

*In recognition of his outstanding contributions to our understanding of complex biological structures and the methods used for determining them.*



In June 1988, Aaron received a letter from the Palace asking him if he would accept a knighthood. He had been chosen as a beneficiary of the Queen's Birthday Honours. The citation was: 'For services to molecular biology'. Aaron had been put up by Dai Rees on behalf of the MRC. A tradition had grown up at the Laboratory of Molecular Biology of refusing such offers. John Kendrew had indeed accepted a knighthood but rather in recognition of his work for the Ministry of Defence than for science. By this time, Aaron was Director of the LMB and deeply involved in negotiations on all levels. He accepted the knighthood because it apparently helped when arguing with civil servants.

On 24th October 1995, the Queen appointed Aaron a member of the Order of Merit (Plate 11), one of the highest orders in the Queen's personal gift. The Order of Merit, founded in 1902 on the occasion of the coronation of King Edward VII, is a special mark of honour for persons of exceptional distinction. Membership is limited to 24 individuals. Aaron was elected to replace Dorothy Hodgkin, who had died the previous year. Since both Dorothy and Aaron were crystallographers, and both had won the Nobel Prize for Chemistry, this seemed an appropriate succession. Membership is accompanied by receipt of the Badge of the Order. To Aaron's delight, Nelson Mandela was appointed to honorary membership in the same year (full membership is restricted to UK nationals).

In 2005, Aaron was awarded the Order of Mapungubwe, South Africa's highest honour, 'for achievements in the international area, which have served South Africa's interest'.

About a millennium ago, Mapungubwe Hill was settled by an iron-age people with much skill in metal working: one of the artefacts they left behind is a splendid little rhinoceros made of gold. Although the site was discovered in the 1930s, knowledge of the finding remained very restricted because the fundamental tenet of the Apartheid policy was that the indigenous population was primitive and uncultured. The people who lived on Mapungubwe Hill were clearly cultured and had trade links extending as far as China. In recognition of their culture, the Mapungubwe badge consists of an oval frame above an inverted trapezium. Inside the oval frame sits a golden rhinoceros, with the sun rising above Mapungubwe Hill in the background (Plate 12).

The award has four classes (platinum, gold, silver and bronze). Aaron was awarded gold 'for exceptional achievements in medical science'.

Nobel Laureates appear to qualify for gold: Aaron's colleague Sydney Brenner received the award in gold in 2004, as did Allan Cormack in 2002 and Doris Lessing in 2008. In 2005, the Literature Nobel Laureate J. M. Coetzee was a co-recipient. The award is given by the President of South Africa, who at this time was Thabo Mbeki. Mbeki had been a very competent executive during Mandela's presidency. He did much to get the South African economy rolling. However, when he became President, his continued tolerance of Robert Mugabe and strange (and very damaging) views that HIV does not cause AIDS diminished his reputation. Moreover, from within South Africa, his style of government was thought by some to be remote and academic. Archbishop Desmond Tutu was particularly critical, pointing out that a culture of 'sycophantic, obsequious conformity' was emerging under Mbeki<sup>3</sup>. Aaron was well aware of these problems: his second cousin, Mark Gevisser, was writing Mbeki's biography<sup>4</sup>. Mbeki's irrational HIV denial policy had cost many lives. Aaron wondered about taking an award from Mbeki but he reasoned that, whatever his views, Mbeki was the representative of South Africa and Aaron was proud of the award.

Thus, one fine day in April 2005, Aaron and Liebe were in Pretoria for the award ceremony. It was the antithesis of the Nobel award ceremony. The awardees and guests sat in a large amphitheatre. The President sat on a slightly raised dais. People, mostly black, performed and danced in the centre in a light-hearted atmosphere. The presentation was organised in groups according to the class of the award, with the bronze awards first. Widows and mothers received the award on behalf of partners or sons distinguished for their bravery. Mbeki was very relaxed and offered a helping hand if needed. Each award was accompanied by a laudation: some were in English, some in Xhosa. Interspersed were performances from a string quartet, a choir and an indigenous dance group. Last came the two gold awards to the two Nobel Laureates.

Then there was lunch in an open tent. Aaron and Liebe sat with Thabo Mbeki and his wife Zanele. Mbeki is a charming man with an interest in Shakespeare, and for the Klugs it turned out to be an agreeable meeting. Apartheid was now just unpleasant history.

<sup>3</sup> 'Special Report: Thabo Mbeki: A man of two faces' *The Economist* (20th January 2005).

<sup>4</sup> Gevisser, M. *Thabo Mbeki: The Dream Deferred*. Jonathan Ball (2007)