

Preface

The more I have used the Nobel archives the more I have come to appreciate their unique value. It is unlikely that there is any matching historical material in any other part of the world. The invited obligatory nominations vary in comprehensibility and content, but can sometimes be very informative. The core material, however, is the reviews made by the members of the Nobel Committees, at the time the only referees used. The reviews are generally very thorough and provide the best possible evaluation to be expected from a particular Swedish scientist, who might benefit from his close interactions with other members of the committee. In order to fully interpret the proposed priorities one needs to be well familiarized with idiomatic Swedish and the traditional academic tuning of the time. Following the gradual shift and maturation of evaluations of a given candidate(s) it is possible to develop an insight into the progressive change in understanding — the gradual erosion of prevailing dogmas — with time. This is of particular interest during the sixth decade of the previous century when it was eventually appreciated that it was nucleic acids which played the critical role in information storage in biology and not the proteins. The latter instead provided structures, tools and messages for the diversified cellular functions. By use of the Nobel archives it is possible to examine this kind of revolution in real time. The relative stability of member representation in the committees during the 1950s and 1960s further substantiates the significance of the assessments in linear time.

This book is a sequel to my previous book *Nobel Prizes and Life Sciences*, but it has a different origin. The chapters have been written directly for the book, whereas in the earlier book several chapters were adaptations of review articles written for scientific journals. The time covered in the present book, with one exception, relates to the period 1960–1962, and the focus is mainly

on Nobel Prizes in physiology or medicine. However the archives both at the Karolinska Institute and at the Center for the History of Science at the Royal Swedish Academy of Sciences, throughout these years have been reviewed in parallel, although among the prizes in chemistry only the one in 1962 is presented in detail. In addition, somewhat extended comments have also been given on the chemistry prizes in 1954 and 1964. It should be emphasized that as a consequence of the emergence of molecular biology in the 1950s, with time there has been an increasing overlap between candidates reviewed for a Nobel Prize in either chemistry or in physiology or medicine.

Chapter 5 presents a different time frame, since it concerns the Nobel Prize in chemistry of 1943, awarded in 1944 to Georg de Hevesy. There are several reasons for the inclusion of this chapter in the present book. It deals with the discovery of a new technique to label biological products by use of radioactive isotopes, which became an indispensable tool in the development of the field of molecular biology. In the presentation of Hevesy, a physicist, who received a Nobel Prize in chemistry, for the development of a technique with wide applications in biology, I have profited enormously from information provided by his son Georg Hevesy, Stockholm, and his son-in-law Gustaf Arrhenius, La Jolla, CA. I was also greatly helped by material from Siegfried Niese, who kindly shared with me his comprehensive biography in German of Hevesy. Additional material about Hevesy was provided by Anders Lundgren, Uppsala University. Jonas Friséen provided copies of articles to assist in describing the recent work by his research group.

The first chapter describes the Australian virologist Burnet to whom I was introduced by my predecessor in the chair of virology at the Karolinska Institute, Sven Gard. Although Gard argued very strongly throughout the 1950s for a prize in virology for Burnet, this never came about. The committee resolved the problem of acknowledging Burnet's entitlement to a prize by awarding him a shared prize in immunology in 1960. The process of writing about scientists who later receive Nobel Prizes leads to a varying degree of familiarization with each one of them.

Among the candidates discussed in this book Burnet was second in terms of such a familiarity, mostly because of his prolific writing, not only autobiographically but also about a wide range of existential problems. I am grateful to his Australian colleagues, his successor as Director of the Walter and Eliza Hall Institute, Gus Nossal, and his early student and later professorial colleague Derek Denton, for personal information about Burnet. Denton in collaboration with Suzanne Cory, kindly arranged for pictures of Burnet's

Nobel Prize gold medal and diploma, kept at the Institute. Another Australian colleague, the immunologist and Nobel Laureate Peter Doherty, kindly read some early versions of the first chapters on immunology and also generously provided some comments for the back cover of the book.

The second chapter presents Burnet's co-recipient of a Nobel Prize in 1960 for the discovery of immunological tolerance, Peter Medawar. Like Burnet he has presented himself and his thoughts on a wide range of topics on life in books. Additional comments on this prize and on these two statesmen of science have been provided by George Klein. He represents an exceptional source of information because he has been involved in the Nobel work at the Karolinska Institute since the late 1950s and in addition he has written a number of essays (mostly in Swedish) frequently involving his scientific colleagues. Also at the stage when full texts for the chapters of the book had been finalized I have continued to receive comments from colleagues with whom I have shared some texts. It is apparent that it was the Nobel Committee which took the initiative to combine Burnet and Medawar. Arthur Silverstein has pointed out to me that this initiative was taken at the time when immunological tolerance had not as yet become a scientific household word.

Thirty years had passed since the previous recognition of the discipline of immunology by a Nobel Prize when the 1960 prize to Burnet and Medawar was awarded. Since then the field has been repeatedly recognized, reflecting the major steps of advances that have been made. It was therefore decided to present these milestone advances in immunology and also to reflect on whether certain omissions might have been made. This is presented in Chapter 3. The field of immunology has indeed advanced into a very complex science and we still need to gain further understanding of the fundamentals of immune regulations to intervene rationally in the etiological process of, for example, autoimmune diseases.

The success story of managing a balanced immune suppression which has allowed successful transplantation of organs is dealt with in Chapter 4. It was discussed against the background of the widening understanding of persistent virus infections in our bodies. Doherty and Klas Kärre made some comments on both Chapters 3 and 4. Bodvar Vandvik, a neuroimmunologist, read Chapters 1 to 4 and provided some constructive criticism. He also recommended that some sections from the chapters might be taken out to form a separate concluding chapter, which finally was done. Jan Lindsten provided important information and also pictures from the work of the Nobel Committee at the Karolinska Institute during the 1970s and 1980s. He also

shared important material for discussion of Georg von Békésy's interest in the arts in Chapter 6. Eva Myrdal, the director of research and documentation at the World Cultural Museums (a consortium of four museums; the World Cultural Museum in Gothenburg, and in Stockholm, the Ethnographic museum, the East Asiatic museum and the Mediterranean Museum) provided important information about the deposition at the three museums in Stockholm of the objects donated by Békésy to the Nobel Foundation. Additional information about the art at the office of the Nobel Committee at the Karolinska Institute was supplied by its secretary Göran Hansson. Bertil Hamberger provided a picture of his father, Carl-Axel Hamberger, a central figure in the developments that led to a prize to Békésy.

1962 was a particularly important year in the history of Nobel prizes in chemistry and in physiology or medicine. Two exceptionally critical advances were recognized, the principles of folding of large protein molecules and the structure of DNA. Two extensive chapters deal with these major events. Anders Liljas provided valuable information for the section on Lawrence Bragg and also shared two pictures. One of them had been taken by Ivar Olofsson, who also provided an additional picture from his own collection. Another private picture was provided by Carol Corillon. In Chapter 8 Per-Åke Albertsson provided information about Tiselius. Aaron Klug gave encouraging support to the text and kindly provided some comments for the back cover. Crick's son from his first marriage, Michael, kindly pointed out to me that in addition to the participation in the Nobel ceremonies of Crick's two daughters together with Odile Crick, he himself was also present at the Stockholm events. Wilhelm Engström provided some private archival material and also a picture of his father Arne Engström, which was eventually used in Chapter 6. Another picture of Crick and Rich was kindly made available by Shuguang Zhang. James Darnell gave perspectives on the gene concept and Istvan Hargittai provided valuable information both through his different books on Nobel Prizes and by personal exchange of information. Craig Venter generously provided comments on the composition of Chapter 8.

The person I felt that I got to know the best among all those investigated was Rosalind Franklin, although admittedly there are probably parts of her personality that might have remained hidden even to her closest friends and relatives. In the archives of the J. Craig Venter Institute there is rich material about Franklin, including several of her handwritten letters. Seeing the hand-writing of a person, although they have been dead for a long time, gives a feeling of a more immediate contact. After I had finished the writing of

Chapter 8 on the structure of DNA, I came upon one more book on Franklin, in addition to the valuable books by Anne Sayre and Brenda Maddox. It had been published in 2012 and was written by Jenifer Glynn. Its title is *My Sister Rosalind Franklin* and it is a charming book. Glynn kindly gave some comments to the text of Chapter 8, which resulted in some late minute changes. Finally, Jan Witkowski at the Cold Spring Harbor Laboratory also gave very valuable comments on the final version of this chapter.

It is my hope that the present book will serve to further discussion about the conduct of science and about the personalities of those who pursue it. In this Preface I would like to quote from one letter, presented in Glynn's book, by Franklin to her father during her time in Paris. It provides a general illustration of the particular involvements of scientists:

You enquire about the importance of my job. Perhaps it misleads you that it is called a job. The place where I work is purely a research establishment, and my particular work has no immediate industrial objective (some people would call it "pure research", while others argue that there is no such thing as "pure research", since all scientific advancement is ultimately useful). The position, therefore, is that I am paid and given facilities to work on my own ideas — and anybody else's I may be able to borrow. Its importance depends, of course, on what I make of it — what results I get, if any.

It is difficult to describe the position of a scientist better, and others did indeed borrow her ideas and findings!

My association with the J. Craig Venter Institute as the vice-chairman of its board of trustees has provided great benefits for the development of this book. It has been possible for me to get access to selected books of value for the work, requests kindly taken care of by Julie Adelson, and in particular to take advantage of the rich collection of archival material available at the Institute. The core of the assembled material is a part of the Jeremy Norman collection acquired by the Institute some years ago. Since the autumn of 2012 the collection has been skillfully managed by Crystal Carpenter. She has provided invaluable help in finding selected items and she has also kindly taken photographs of particular objects included in the picture material of the book.

I would also like to extend my thanks for the many pleasant contacts at World Scientific Publishing in Singapore. In particular I am grateful to its Chairman Professor Kok Khoo Phua for the confidence he has displayed in

my writing about Nobel Prizes — the stories about individuals, environments and advancing frontiers of knowledge. My editor Kim Tan has provided a very efficient professional support and has arranged a pleasant working environment during my visits to Singapore. Colleagues at the Nanyang Technical University, Singapore, Bertil Andersson and Jan Vasbinder have given kind encouragement to my work.

Since English is not my native language I have had all texts read by Harry D. Watson. His insightful and expedient correcting of the texts is much appreciated. The fees for his assistance were covered by a grant from the Sven and Dagmar Salén Foundation

Many different organizations that are a part of the Nobel system have provided valuable assistance to my work. At the Nobel Foundation Jonna Petterson and her temporary substitute Siavash Pournouri kindly helped me to obtain pictures of Jim Watson taken during the Nobel Week Dialogue arranged in December 2012 and also transferred information about Nobel medals. At the Nobel Museum Olov (Olle) Amelin informed me about the busts of Watson and Crick donated to the museum in December 2012. In collaboration with him, Watson and in particular the artist Daniel Altschuler it was arranged to use pictures of the busts on the book cover. At the Karolinska Institute, the secretary of the Nobel committee for physiology or medicine, Göran Hansson, gave me permission to examine the archives that progressively became available for analysis. In the office of the committee Ann-Mari Dumanski and Tatiana Goriatcheva looked after me well during my January visits and on other occasions.

I have my office at the Center for the History of Science at the Royal Swedish Academy of Sciences. It is a very attractive working environment, not only because the Nobel Archives are 30 seconds away but in particular because of the people working at the Center. Its director Karl (Kalle) Grandin has arranged for all the support I need for my work and in particular he has spent many hours working on the table and picture materials for this book. He has always been generous with his time helping me out also when I had problems with my computer. Maria Asp, Anne Miche de Malleray, Jonas Häggblom, Åse Frid and not least my next door neighbor Bengt Jangfeldt — a great humanist, writer and intellectual sparring-partner — have all contributed to a working environment colored by happiness and engaged professional insights. An unrestricted number of diverse subjects have been discussed during coffee and lunch breaks.

My final thanks go to my family. My wife Margareta's unfailing support and endurance of my writing obsessions has made it possible to bring the project of producing this book to a conclusion. My first Nobel book was dedicated to her, but this second book I would like to dedicate to our three children Jacob, Lars (Lasse) and Christina (Titti). Their importance for the richness and joy of our life cannot be overestimated.

Preface

Chapter 1

A Magician of Virology

The Shaping of a Scientist

Years as an Assistant

Phages and Poliovirus

Poliovirus

The Embodiment of Science

Pioneering and the Virus

Virus as Case History

The Sherlock Holmes Virus

The Evolutionary Virus

Early Steps: The Virus

Influence Virus: The Virus

Q Fever

Hemagglutination

The Weakness of the Virus

The Continued Evolution

The Golden Age of Virology

Chapter 2

A Divided Nobel Prize

The Early Nobel Prize

From Virology to the

Self and Nobel