The latest work indicates that this process could be followed by a charge separation giving a Car^+–Chl^- type radical pair. Among the photoreceptors, rhodopsins with their extremely fast (200–500 fs) *cis–trans* isomerization, continue to be investigated in order to elucidate their ultra-fast dynamics. The early mechanism of a two-step model involving a barrierless transition from S_1 to S_0 is replaced by a three-step model in which the excited S_1 state has a barrier along the isomerization coordinate. Studies involving time-resolved vibrational spectra showed that the vibrational modes around the C=C bond undergoing isomerization could play an important role in the dynamics.

The year 2008 is significant in that the Large Hadron Collider at CERN, Geneva, is being used to look for the Higgs boson in what has been described as 'the greatest experiment in the world'. The advances in the standard model of particle physics in the last half century have been through a series of symmetry breaking in fundamental interactions. In atomic and molecular systems, certain types of symmetry breaking are not unusual. As approximations are often made in the Hamiltonian of these many-body systems, some symmetries which are present at a certain level of the Hamiltonian may disappear when the Hamiltonian is made more accurate. The parity symmetry between a pair of chiral molecules is, however, intrinsic in the sense that no matter how accurate the Hamiltonian is, the mirror-image relationship between the pair would always hold. But if nature does not conserve this symmetry – or the parity is violated – for molecules, its consequence should be observable. In the last two decades, enormous efforts have been made to examine parity violation in chiral molecules. The groups of M. Quack (ETH, Zurich) and Ch. Chardonnet (University of Paris) have made important contributions in attempts to test parity violations in chiral molecules. Both groups approach the problem by noting that if the parity is indeed violated, a pair of chiral molecules should have different energies. We can appreciate the difficulty of experimentally testing this when we note that the difference in the energy is expected to be exceedingly small. The estimated value is about 100 atto-electron volt (10^{-18} eV) for a simple molecule like CHFClBr. The chapter by Quack *et al.* on parity violation gives a lucid and pedagogic description of this very fundamental aspect of interactions in molecules.

The role of X-rays in chemistry is normally associated with structure determination in crystals. However, with the availability of coherent X-rays from synchrotron sources and free electron lasers, efforts are being made to apply X-ray diffraction techniques to amorphous systems, many of which are biological and non-crystallizable in nature. The chapter by J. Miao *et al.* describes the advances made in this decade for imaging non-crystalline material, including cells and protein complexes.

These days when the gap between the expertise in theoretical chemistry and experimental chemistry is steadily widening, the autobiography of Rice is highly relevant and inspiring. His life – its evolution as a physical chemist/chemical physicist, as he describes it – shows how excellent theoretical understanding and fine experiments go hand in hand in making lasting contributions to science.

Finally a few words about the format of this book. Starting from the previous volume, the formatting of the *ARPC* has changed considerably. Extra margins have been added to incorporate sidebar definitions, short figure captions, and significance of selected references. However, barely 5% of the extra margins have been used for such purposes. Some of the sidebar definitions are even superfluous (e.g. ET (electron transfer), IR (infrared), AFM (atomic force microscope), PES (potential energy surface), HF (Hartree–Fock), etc.) for the intended readership. I feel that the extra margin is quite unnecessary; it merely adds to the size and bulk of the book.

In summary, I feel that this book should be useful to postdoctoral and regular researchers contemplating a change of research field, who want to get a taste of recent advances in highly specialized subdivisions of physical chemistry. As many chapters are not written in a pedagogical style, I am not sure if most aspiring graduate students would find the book accessible.

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Einstein's Nobel Prize – A Glimpse Behind Closed Doors – The Archival Evidence. Aant Elzinga. Watson Publishing International, Sagamore Beach, 2006, 228 pp. Price: US$ 39.95.

Norwegian historian of science R. M. Friedman[1] wrote a brief story on the Nobel Prize for physics for the renowned physicist Albert Einstein. In this book Aant Elzinga from Sweden gives thorough details. The leitmotiv of the book is: Why did some members of the Nobel Committee persistently oppose the award, while the nominators often proposed Einstein name for his work on the theory of relativity?

In 1921, the Nobel Prize for physics was reserved. It was awarded to Einstein in 1922 'for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect', as we learn in the 'Introduction'. In the present book the reader finds something completely different. Einstein neither attended the Nobel Prize ceremony, nor delivered a lecture (in Stockholm) on the topic for which he was awarded the Prize. He received the medal in April 1923, as there was dispute due to his nationality. Both the Germans and Swiss claimed him as 'their' man. In the end the Prize was delivered to Einstein by the Swedish ambassador to Germany.

Before starting with the Nobel Prize, Elzinga gives a brief review of Einstein's life, scientific papers from the year 1905 and his position in the international community. The 'real story' of Einstein's Nobel Prize starts with Chapter 5 entitled 'Into the mangle of Nobel'. Here the author gives the educational and research background of the Committee's members. Until 1914 Einstein was nominated ten times, mainly for his work on the theory of relativity (for all the years from 1910 to 1923, details such as nominators, and for what they had nominated Einstein are given in the Appendix, pp. 211–217). Elzinga shows that in 1914 the Committee reported that Einstein's theory of relativity was '. . . empirically deficient, even on the point of being speculative or rather a matter of philosophy rather than science' (p. 84, 85). Between 1915 and 1919, Einstein was nominated 15 times for his work on the theory of relativity, light quanta, and Brownian motion. We learn that the Committee discredited the theory of relativity under one pretext or the other. Either it had 'empirical deficiencies' (p. 112) or 'failed to meet the experimental support' (p. 113), or it was suspected whether 'it is at all a theory' (p. 116).

What made Einstein and the theory of relativity popular was the solar eclipse of 6 November 1919. Astrophysicists proved the correctness of Einstein's view that light bends when it passes near a heavenly body. In Chapter 8, 'In the wake of a solar eclipse', the author gives glimpses of the political situation after World War I. It is crucial to the following chapters to show Einstein's international reputation as a scientist as well as a politically active pacifist. At the same time it throws light on the political interests of the Nobel Committee in the international context. In 1920, 1921 and 1922, Einstein was nominated 8, 14 and 17 times respectively. According to the author, in 1920 the Nobel Committee recognized some of Einstein's achievements such as the finding on Brownian movement, theoretical work on changes of specific heat of solid bodies and photoelectric effect, but about relativity it was noted that 'more experimental tests were needed before one could take seriously Einstein's candidacy for a prize based on it' (p. 146). Neither the Committee nor the experts (who were also members) changed their views about Einstein's contributions, in particular the theory of relativity, until C. W. Oseen – a physicist with specialization in mechanics and mathematical physics, appeared on the stage. He prepared the ground for Bohr's and Einstein's Nobel Prize, as we see in 'Finding the right formula – Einstein + Bohr'. This chapter which is the backbone of the present book, explains the causes which favoured Einstein. First, Oseen in his report divided Einstein's findings in such a way that he could appease the experimentalists, who had power in the committee. He did not give importance to the theory of relativity. Second, two members of the Committee had died and the new members changed the balance. Third, in order to appease opponents like A. Gullstrand, the Nobel Committee did not change its opinion on relativity. Fourth, another influential opponent Arrhenius, who in the past wrote negative reports, changed his views. Being pro-German, he wanted to integrate the German scientific community, which was internationally boycotted after World War I. Also, Arrhenius wanted to main the international character of the Nobel Prize. In Elzinga's words: 'In Einstein's case, it was obviously a much easier task to uphold this ideal. He himself was a symbol for peace and progress, so the symbolic capital of recognition was easily converted into political currency. Not only that, in the eyes of many people it also, in turn, helped reassert purity of the prize as cultural capital' (p. 190).

In fact, the story of Einstein's prize has been told in the first 11 chapters. Chapter 12 entitled 'A celebrity at the amusement park: Göteborg 1923', might seem to be out of place. But it is not so, as it gives the causes for opposition to the relativity theory. Elzinga shows that in order to understand the opposition to the theory of relativity one needs to understand the influence of Swedish philosophers during 1915–1930. Elzinga's one of the most important conclusions is that the ideals of science are reigned by the research culture in which it is done. Understandably, the reactions of the press to Einstein's visit and his lecture are also given in this chapter.

The present book is recommended to the general public as well as experts from social and natural sciences.

1. Friedman, R. M., *The Politics of Excellence – Behind the Nobel Prize in Science*, AWH Freeman Book, New York, 2001, pp. 119–140.

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Just Genes: The Ethics of Genetic Technologies. Carol Isaacson Barash. Praeger Publishers, CT, USA. 2007. Price: US$ 49.95.

The subject of genetics, genetic engineering, and genetic technologies is very topical for the present time (and indeed perhaps for any other). Developments in the field, of which the most significant landmarks may be Mendel's breeding experiments, Watson and Crick's description of the structure of DNA, and the successful conclusion of the Human Genome Project, give rise to many hopes and fears about the uses of the new understanding and power. The specific topic of ethics in relation to genetics has been addressed in several books, the best-regarded of which is arguably that of Reiss and Straughan[1]. (I have also heard good things about the recent one by Berry[2], but have not read it myself.)

The present book is thus quite topical, and addresses a subject likely to be of interest to many. Some of the issues addressed by it can be gleaned from the headings of a few chapters: 'Introduction: Are We Ever Talking Just about Genes?', 'The Use and Abuse of Genetic Information: Genetic Privacy and Genetic Discrimination', 'Genetically Modified Foods: Do We Become What We Eat?' and 'Cloning and Stem Cells: Fact, Fiction, and Ethics'.

Unfortunately, in spite of its very interesting subject, this book cannot, in my opinion, be called a good one. A major complaint I must make of it is that it is, simply put, rather poorly written – in a style that violates basic principles of English composition we all learn in college and even earlier. Consider the sentence (p. 2), 'Crossbreeding of crops and animals, for example, had been done for hundreds of years, though largely by accident or intent' – what else could there be, beside accident and intent? Elsewhere (p. 57), reference is made to 'the late 1950s' (sic) discovery that the human Y chromosome plays a major role in sex determination', suggesting that the late 1950s were the sentient agents that made such a discovery. Many technical words are used before being defined (or without being defined).

Some errors in scientific writing also ought to have been corrected; e.g. (p. 105), 'Geneticists now use the following algebraic equations to describe the origins of variability:

$$Vp = Vg + Ve \text{ and that } Vp = VgXVe^{15}\text{'}.$$

It took me a little while to realize that X should actually be $\times$, that the two equations should have been on different lines, and that the superscripted '15' is actually a reference to an endnote, not a mathematical power in the algebraic expression. It would also have been preferable that Vp, etc. be indicated with proper