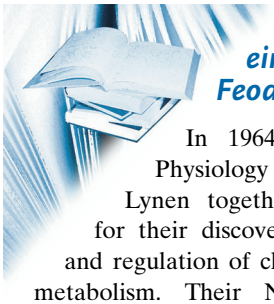

Sei naiv und mach' ein Experiment: Feodor Lynen

In 1964, the Nobel Prize in Physiology was awarded to Feodor Lynen together with Konrad Bloch for their discoveries on the mechanism and regulation of cholesterol and fatty acid metabolism. Their Nobel Prize certificate displayed a symbolized structure of carboxybiotin, the intermediate in malonyl-CoA synthesis from acetyl-CoA and bicarbonate, identified by Lynen in 1961, 50 years after his birth on April 6, 1911 in Munich.

"Be naïve and do an experiment" was the philosophy of this great biochemist and the title of Lynen's first biography written on the occasion of his hundredth birthday by Heike Will. The biography written in German is based not only on the literature but also on numerous interviews with Lynen's scientific colleagues and family members. Countless anecdotes make the well-organized book fascinating to read for both biochemists and all those interested in the history of science in Germany during the Third Reich and after the Second World War.

The biography of Feodor Lynen begins in 1901, before his birth. In that year, the Lynen family moved from Aachen to Munich, where Feodor's father Carl Lynen was Professor for Mechanical Engineering at the Technical University until his death in 1920, when Feodor was only 10 years old. Feodor Lynen remained in Munich throughout his life and career—for his early schooling, his chemistry studies from 1930 to 1934, his doctoral studies under the guidance of the Nobel Laureate Heinrich Wieland (thesis 1937: "On the toxic substances in Amanita"), his marriage to Eva Wieland (1937), the births of their five children, his Habilitation (thesis 1941: "On the metabolism of succinic acid and citric acid and the participation of phosphoric acids in the respiration of yeasts"), his appointment as Professor of Biochemistry (1947), and his membership in the Max Planck Society and appointment as Director of the Institute for Cell Chemistry (1954; later renamed Institute for Biochemistry), until his death on August 6, 1979. Feodor Lynen remained in Munich by choice and not because of a lack of ample opportunities to leave. Offers of professorships in Bern (1952), Marburg (1952), Harvard (1954), Frankfurt (1955), Zürich (1955), and Miami, Florida (1965) were tempting, but Munich always won in the end.

Lynen's route to fame began in 1951 with a paper published in *Angewandte Chemie* entitled "On the chemical structure of activated acetic acid". In 1947, Fritz Lipmann had discovered coenzyme A as the cofactor required for acetate activation, but it remained unclear how these two compounds interacted. It was Lynen who then provided evidence that the thiol group of coenzyme A forms a thioester bond with acetate, thereby activating acetate. The importance of this discovery was quickly recognized internationally. Lynen's breakthrough, six years after the Second World War, placed Munich back on the map as a center of biochemistry, as it once had been with Richard Willstätter (Nobel Prize in 1915) and Heinrich Wieland (Nobel Prize in 1927). As early as 1952, when Munich was still showing signs of the heavy toll of the past war, Al Lehninger and Severo Ochoa from the USA visited Lynen. A collaboration with Ochoa resulted in two joint publications in 1952 and 1953 on the enzymes of fatty acid metabolism, one of which became a citation classic. Fritz Lipmann, Earl and Theresa Stadtman, Harland Wood, and Lester Krampitz were among the many scientists from the USA to follow with visits to Lynen. The doors to the international community of biochemists and chemists, which Germany had closed in 1933, began to open again.

Feodor Lynen had not compromised himself during the Third Reich, having been neither a member of the NSDAP nor of the SA or SS. Because of the aftermath of a ski accident in 1930, Lynen was not recruited as a soldier and could continue to work during the war in the laboratory of Heinrich Wieland, who endeavored to provide an "oasis of decency" in his Munich institute (*Heinrich Wieland* by S. Wieland, A.-B. Hertkorn, and F. Dunkel, 2008, Wiley-VCH). After the war, Lynen was therefore not affected by any political reservations, and indeed, in 1959, he was among the first group of scientists (with Otto Hahn and Wolfgang Gentner) to be invited to visit Israel after the war.

The year 1951 marked the first of many other discoveries of the Lynen laboratory to follow: clarification of the steps involved in β-oxidation of fatty acids; identification of β-hydroxy-β-methylglutaryl-CoA (HMG-CoA) as an intermediate in ketone body formation and in polyisoprenoid biosynthesis; elucidation of isopentenyl pyrophosphate and dimethylallyl pyrophosphate as biosynthetic precursors of cholesterol, carotenoids, and other polyisoprenoids; demonstration of malonyl-CoA as an intermediate in long-chain fatty acid biosynthesis and in polyketide biosynthesis from acetyl-CoA; and identification of HMG-CoA reductase and acetyl-CoA carboxylase as sites of cholesterol and fatty acid biosynthesis, respectively. Within only ten years, Lynen and his collaborators had laid the foundation of the central role of acetyl-CoA in metabolism.

In the years following his Nobel Prize of 1964, Lynen together with his collaborators followed up many of the discoveries. The structures of the multi-

Sei naiv und mach ein Experiment: Feodor Lynen Biographie des Münchner Biochemikers und Nobelpreisträgers. By Heike Will. Wiley-VCH, Weinheim 2011. 349 pp., hardcover, € 29.90.—ISBN 978-527328932

enzyme complexes involved in long-chain fatty acid synthesis and polyketide synthesis were partially unraveled, and the regulation of the various pathways at the allosteric and protein biosynthesis levels was studied. Lynen became Vice President of the Max Planck Society (1972–1978) and President of the Alexander von Humboldt Foundation (1975–1979). The Humboldt Foundation, which mainly supports young scientists from abroad during postdoctoral studies in Germany, established, in Lynen's honor after his death, the Feodor Lynen Research Fellowship for young German scientists for postdoctoral work abroad.

With respect to the biography, I have only little to criticize. The description of Lynen's many negotiations for remaining at the University of Munich and with the Max Planck Society perhaps takes up a bit too much space. Instead, more details on Lynen's most-important publications would have been appreciated. But all in all, I congratulate Dr. Heike Will on writing this interesting biography.

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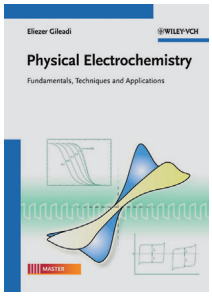

Physical Electrochemistry
Fundamentals, Techniques and Applications. By Eliezer Gileadi. Wiley-VCH, Weinheim 2011. 374 pp., hardcover, € 69.00.—ISBN 978-3527319701

Physical Electrochemistry

This book is written as a graduate course textbook, intended primarily for chemistry and chemical engineering students, but would be also a welcome addition to the reference library of anybody who deals with electrochemistry, at any level. The style of the presentation is clear and true to the title: *Physical Electrochemistry*, with emphasis on electrochemical principles rather than on electrochemical methods. There are no references and no problem sets. The important formulae are presented as such, without derivation, but the logical thread is clearly outlined in the text.

The material is divided into 20 chapters. The first three deal with the "essentials", i.e. the meaning of interfacial potential, ionic versus electronic conduction, transport, equilibrium and non-equilibrium at interface, etc.; everything that student needs to consider before diving into the in-depth of explanations, which are found in the following chapters. The double layer at metal-ionic interface is covered in Chapters 8 and 9. Third chapter is devoted to the overview measurement of electrical parameters, which are covered in depth in Chapters 14–17. Charge transfer kinetics and coupled chemical–electrochemical reactions are described in Chapters 4 and 5–7, respectively, with somewhat uneven attention to detail.

Some topics that reflect the life-long electrochemical interests of the author are included and treated in greater depth: They are electroplating (Chapter 19), corrosion (Chapter 18), and energy conversion/storage (Chapter 20). A new topic of nano-aspects of electrocatalysis is covered on 7 pages. Some topics that are sometimes found in similar books, and are not included here, are the electrochemistry at the interface of two immiscible liquids (with the exception of mercury), ancillary techniques, electroanalytical chemistry, semiconductor electrodes, and bulk electrolytes. However, with those topics included the amount of material would have definitely exceeded one semester.

Would I use this book as a principal teaching text in the graduate course? The answer is unequivocally "yes", but I would need to supplement it with additional materials to meet specific needs of my course. I believe that such adjustment would have to be made by any teacher. The material is presented clearly and logically. The graphics are clear and there are plenty of examples and invaluable practical hints, as would be expected from an author who dedicated his life to teaching and practicing electrochemistry.

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