

Crucible of Science

In our time, only a minority of biochemists still have some knowledge about the history of their subject. In consequence, there is a threat that more and more of the still existing reminiscences about the lives of our scientific antecedents and the impact of their work will be lost. John H. Exton—a prominent researcher in the field of cellular signaling—is one of the few authors who are responding to the need to preserve the gorgeous heritage of biochemistry of the last century.

This book is devoted to the life and work of the couple Carl and Gerty Cori, whose names are probably still known to the biochemistry students of today from the Cori cycle and the Cori ester. In thirty chapters, the readers become familiar with the lives and the scientific work of Carl Ferdinand Cori (born on December 5th 1896 in Prague, died on October 20th 1984 in Cambridge, Massachusetts) and Gertrude (“Gerty”) Theresa Cori, née Radnitz (born on August 15th 1896 in Prague, died on October 26th 1957 in St. Louis, Missouri), as well as those of a great number of colleagues, collaborators, and guests who worked in the Cori laboratory.

The introduction tells the reader about the families and the early lives of the Coris. Carl’s maternal grandfather, Ferdinand Lippich, was Professor of Theoretical Physics at the Karls University (Charles Ferdinand University) in Prague and the inventor of the Lippich polarimeter, and thus the inquisitive Carl became familiar with the experimental sciences. That aspect of Carl’s education was continued by his father, who was Professor of Zoology in Prague and was appointed director of the Marine Biological Laboratory in Trieste in 1898. In this way, Carl came into contact with science at a very early age. Gerty came from a Jewish family. Her father was a chemist in the sugar industry.

Carl and Gerty met during their medical courses in Prague (1914–1920) and married in Vienna in 1920. Gerty shared Carl’s interest in experimental medical research. After finishing their medical training, Carl and Gerty worked for short periods in the pharmacological institutes in Vienna and Graz, where they soon realized the dangers that emanated from the spread of anti-semitism in Europe. In 1922, they decided to emigrate to the United States of America. Both found employment in the State Institute of Malignant Diseases in Buffalo, New York State. It was probably the award of the Nobel Prize in 1922 to Otto Meyerhof for the discovery of the glycogen–lactate cycle in muscle during physical work that

prompted Carl and Gerty to study the glycogen and lactate metabolism in rats when starved of food and given epinephrine. Shortly after that, they made two important discoveries, firstly the synthesis of glucose and glycogen from non-carbohydrate sources (gluconeogenesis), and secondly the epinephrine-dependent glycogen–lactate cycle between muscle and liver.

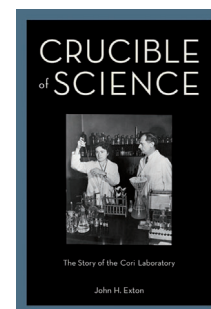
In 1928, the Coris became citizens of the USA, and in 1931 Carl received an offer from the Washington University School of Medicine in St. Louis (Missouri) to take on the directorship of the pharmacology department. In 1945, Carl became Director of the Department of Biological Chemistry of that university. The Cori laboratory attracted students from all parts of the USA and from other countries all over the world. It became a “crucible of science”, as it is aptly termed in the title of the book.

Carl impresses the reader as a quiet, reserved scientist, who is characterized by his power of thorough and analytical thought and his great store of knowledge. Gerty is described as a very active, emotional, and intuitive woman. Together, they were an intensely working couple. Manuscripts intended for publication were read critically by all the scientists in the lab. The author mentions that the well-known British biochemist Sir Philip Randle characterized the Coris as “having an insatiable appetite for knowledge” and being “impassionate partners in the pursuit of art and science”.

In 1947, the Coris won the Nobel Prize for Physiology and Medicine, which they shared with the Argentinian physiologist Bernardo Alberto Houssay (1887–1971), for their wide-ranging discoveries in the field of glycogen metabolism. Gerty Cori was the first woman ever to share in receiving the Nobel Prize for Physiology and Medicine. But the year of the Nobel Prize was also a very hard year for the Coris, because Gerty came down with myelofibrosis, a very rare and fatal chronic disease of the bone marrow. Despite her severe illness, Gerty continued to work in the laboratory until her death in 1957.

Tom Cori (born 1936), the only son of Gerty and Carl, joined Sigma Chemical Company of St. Louis, a worldwide enterprise manufacturing a wide range of highly sophisticated biochemical reagents, in 1970. In 1980 he became president of Sigma-Aldrich Corporation.

The major part of the book deals with the research interests of a great number of colleagues, collaborators, and guests, who were working in the Cori lab in different periods. Each chapter is supplemented by important literature references. A few photos complete the presentation of the people connected with the Coris. Six of the Cori collaborators received Nobel Prizes: Severo Ochoa



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and Arthur Kornberg (both in 1959) for their discovery of the enzymes and the mechanisms of RNA and DNA synthesis, Christian de Duve (1974) for the discovery of lysosomes and peroxisomes, Luis Leloir for the discovery of sugar nucleotides and their role in the biosynthesis of carbohydrates, Earl W. Sutherland for the discovery of cyclic 3',5'-AMP as link in the action of hormones on metabolism, and Edwin Krebs (1992, jointly with Edmond H. Fischer) for the discovery of reversible protein phosphorylation as a mechanism in metabolic regulation.

Because Gerty experienced gender discrimination at the beginning of her employment at Washington University (when, as a promoted scientist, she was given an underpaid appointment), the Coris took care to ensure that this could never happen in their lab. Many female scientists played a prominent role in building the international reputation of the Cori lab. Some examples are the protein chemist Arda Green, the NMR and EPR expert Mildred Cohn, the work of Barbara Illingworth-Brown on glycogen storage disease after the death of Gerty, and that of Jane Harting-Park on muscular dystrophy and on enzymological topics.

One of the foreign scientists who joined the Cori lab was Ernst Helmreich (born July 1st 1922 in Munich); he was there for 14 years: 1954–1955 as a postdoc and 1956–1968, first as an assistant and then as Associate Professor. He worked on the distribution of hexoses and pentoses between

muscle and the extracellular space, and on the allostereism of the AMP-dependent reversible transition between phosphorylase a and phosphorylase b. In 1968, he returned to Germany as professor of physiological chemistry and director of the corresponding institute at the Medical Faculty of the University of Würzburg.

Carl Cori retired from his chair at Washington University in 1966 at the age of 70. In the same year he moved, together with his second wife Anne Fitzgerald-Jones, from St. Louis to Boston, where he was appointed to a visiting Professorship of Biological Chemistry at Harvard Medical School. In his laboratory at the Massachusetts General Hospital, he worked until his death in 1984 at the age of 88.

In summary, the book presents an exciting portrayal of biochemical research in the United States in the 20th century, with its many links to biochemistry in Europe. It is fascinating and informative reading for professional biochemists, students of biochemistry, and all readers interested in the life and work of this famous couple of investigators in the recent past.

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