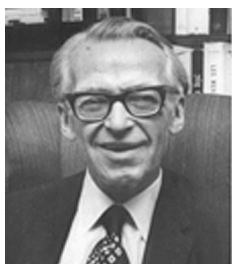


# ERNST DAVID BERGMANN (1903-1975)

Bob Weintraub, Director of the Libraries, The Negev Academic College of Engineering, Beersheva and Ashdod bob@nace.ac.il



Ernst David Bergmann was born in Germany into a Zionist family. His father, Judah Bergmann, was a well-known rabbi and writer on Jewish subjects. Ernst Bergmann earned the doctorate in 1927 under the supervision of Prof.

W. Schlenk at the University of Berlin and continued on the staff. Together Bergmann and Schlenk wrote the two volume *Ausführliches Lehrbuch der Organischen Chemie*. The first volume came out in 1932 and the second in 1939. Because he was a Jew, Bergmann's name was deleted from the title page of the second volume.

In 1933 Bergmann moved to London where he started a long and close association with Chaim Weizmann. He turned down an offer of a position at Oxford from Sir Robert Robinson. Bergmann told Robinson that he was finished with Europe and that his place was in the Jewish Homeland. Years later Robinson recalled with anger that nobody had ever before turned down a scientific appointment at Oxford. Bergmann accepted the position for the planning and a year later as Scientific Director for the future Daniel Sieff Research Institute in Palestine, later part of the Weizmann Institute of Science.

## Weizmann, in recalling Bergmann:

"He entered with the utmost enthusiasm into my plans for the Sieff Institute. I remember a conversation I had in Paris not long after, with Willstätter and Haber, with Bergmann present. He developed before them his plans for work in the Institute which was then nearing completion. The two eminent scientists listened very attentively, and then Willstätter asked me ironically: "How many floors has the Daniel Sieff Institute?" To which I replied: "As far as I know it will have two floors." "Well," said Willstätter, "you had better build a skyscraper if you wish to carry out the program Bergmann has outlined to us." (Trial and Error, 1950)

Bergmann arrived on January 1<sup>st</sup>, 1934, in Palestine and worked at the Sieff Institute until the period of World War II. He then participated in defense related projects in France, England and in the

United States. This included the development together with Chaim Weizmann of the catarole process (catalytic aromatization of olefins, by high-temperature cracking) and the production of monomers necessary for synthetic rubbers from agricultural raw materials. Bergmann returned to Rehovot in 1946 and stayed on at the Weizmann Institute of Science until 1952 at which time he accepted the appointment to a chair of Organic Chemistry at the Hebrew University of Jerusalem, Israel. In the years 1952-4 he also lectured and directed graduate students at the Technion.

"Ben-Gurion, the charismatic leader, was supported by Bergmann, a visionary scientist, and by Peres, an indefatigable, resourceful, and creative politician and executive. The presence of these three individuals at that particular time and place made the Israeli nuclear project possible. To the extent that one can make such historical judgments, it can be said that, in the absence of any one of these three men and without their unique collaboration, there would not have been an Israeli nuclear project. Other people helped and made important contributions, but the primary credit belongs to these three.

By 1948, Professor Bergmann was already a well-established organic chemist. Since the mid-1930s, he had been a protégé of Chaim Weizmann...but in the late 1940s became increasingly drawn to Ben-Gurion's conviction that science and technology were critical for Israel's future. Indeed, Bergmann fit Ben-Gurion's ideal of a scientist: one who did applied research in the service of the Zionist revolution. In August 1948 Ben-Gurion appointed Bergmann as the head of the scientific department of the newly founded Israel Defense Forces, and three years later he became the prime minister's scientific advisor at the Ministry of Defense. Although Bergmann is best known today as the father of the Israeli nuclear program - he founded the Israel Atomic Energy Commission in 1952 and shaped its early activities - his contribution to the establishment of Israel's Chemical and Biological Warfare capabilities was even more crucial." (A. Cohen: Israel and the Bomb, 1998, and Nonproliferation Review, 2001). Cohen emphasizes "Bergmann's decisive role in convincing Ben-Gurion that nuclear energy might be the key for

the survival and prosperity of Israel, because nuclear technology would create unprecedented options for both civilian and military applications.”

Ernst David Bergmann is recognized as the father and the Dean of Organic Chemistry in Israel. (D. Ginsburg, *Israel J. Chem.*, Vol 1, 1963, and S. Rozen, *J. Fluorine Chem.*, 1998). Bergmann’s chemical work covered wide areas, including the synthesis and properties of polycyclic aromatic compounds and of fulvene derivatives, carcinogenic agents, organic compounds of alkali metals, addition of sodium to double bonds, determination of structures from dipole moments, molecular rearrangements, photochemistry, synthesis in chloroamphenicol series, insect chemistry and insecticides.

Prof. Shlomo Rozen (one of Prof. Bergmann’s last students):

“However, during most of his active life his chief interest has been in fluorine chemistry and fluoro-derivatives of many important metabolic intermediates. Already in the early 50’s he investigated the action of 5-fluorotryptophan on *Escherichia coli*, studied the preparation of  $\alpha$ -fluorocarboxylates and pyruvates and their enolization; looked on the mechanism of poisoning by fluoroacetates and higher alkyl fluoroalkanoates; and prepared a series of fluorinated aromatic amines and trifluoroethanol derivatives. Bergmann also studied in detail the infrared spectra of fluorinated compounds especially fluoropyruvates and many condensations of fluoroacetic acid. His contribution to fluorine chemistry continued with development of many new reactions with silver fluoride, perchloryl fluoride,

fluoromalonates and many types of fluoroheterocycles. The so-called Yarovenko reagent was intensely utilized in his laboratory for making novel fluoroamino acids including fluorinated mevalonic acid derivatives. Fluoropolycyclic carcinogens and fluorophosphorous compounds were also made. In the 60’s Bergmann continued to work on fluoroamino acids but developed also the chemistry of fluorooxaloacetates with which he prepared a series of new compounds. Toward the end of the decade experimentation with trifluoromethyl hypofluorite had also started and several highly interesting results were recorded and published.”

Prof. Bergmann published more than 500 scientific works.

The library of the Negev Academic College of Engineering in Beersheva is honored to hold the chemistry books from Prof. Bergmann’s own collection, including two books which he wrote himself, *The Chemistry of Acetylene Compounds* and *Isomerisation of Organic Compounds*. It is a powerful and poignant tribute to his life’s work that these copies are on a library shelf in Israel with the name Ernst David Bergmann undeleted from the title pages.

E. D. Bergmann’s concluding remark in Jerusalem to the 1970 Conference that he chaired jointly with Bernard Pullman, “Aromaticity, Pseudo-Aromaticity, Anti-Aromaticity”:

“I also hope that you have found the air of Jerusalem scientifically stimulating; it has always been a city of thinkers and prophets, who also believed that their predictions were experimentally verifiable.”