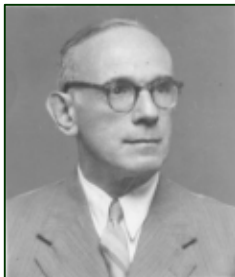


Kurt Paul Jacobsohn (1904-1991)

Isabel Amaral
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Kurt Paul Jacobsohn was born in Berlin, on 31 October 1904, to a German family of Jewish ancestry. His parents were Paul Jacobsohn and Gertrud Ernestine Dewitz Jacobsohn.

He attended the *Luisen-Gymnasium*, in Berlin, and in 1823 he enrolled in the *Wilhelms-Universität* in that same city. In 1924, he was admitted in the institutes of organic chemistry and physical-chemistry in the same university. Between 1926 and 1929, he completed a PhD supervised by Carl Neuberg, at the Kaiser *Wilhelm-Institut für Biochemie*, with a dissertation titled *Bildung und Spaltung von Glukosiden als Methode zur chemischen und*

Trennung razemischer Alkohole in ihre optisch aktiven Komponenten, (Formation and Hydrolysis of Glycosides as a method for chemical and biochemical separation of racemic alcohols in their optical active components), obtaining the highest mark.

In 1927, he was appointed by Carl Neuberg research assistant at the Institute, a position he kept until April 1929. By then, he was invited by Matias Boletto Ferreira de Mira, director of the *Instituto de Investigação Científica Bento da Rocha Cabral* (IRC, Institute of Research Bento da Rocha Cabral), in Lisbon, to direct the section of biological chemistry. Both Ferreira de Mira and the Board of Trustees of the IRC, agreed with Kurt Jacobsohn on a four years contract, but following this period his position became permanent. Jacobsohn obtained in this way a stable position which allowed him to have some hope regarding his future, in contrast to what he might have expected had he stayed in his native country.

Meanwhile, he had married Liesel Jacobsohn and spent his honeymoon on his way to Portugal, together with his parents. Liesel bore him two daughters, Renata and Eva Jacobsohn.

Between 1929 and 1935, Jacobsohn devoted his time to biochemical research at the laboratory allocated by Ferreira de Mira at the IRC, and designed the research programme in the realm of enzymology, which was to be explored by his research school.

In 1935, he became a Portuguese citizen and his PhD, which had been completed at the University of Berlin, was made equivalent to the correspondent in Physical and Chemical Sciences awarded by the University of Lisbon. From then onwards, he engaged in a university career upon suggestion of António Pereira Forjaz, professor of chemistry at the Faculty of Sciences of Lisbon. At the Faculty of Sciences, Jacobson was entrusted the courses on organic chemistry in 1955, and in 1974 he retired.

In the context of his teaching, Jacobsohn published various textbooks with the collaboration of teachers of the Faculty of Sciences of Lisbon and researchers of the IRC. Together with António Pereira Forjaz he wrote the first edition of the book *Química Geral* (General Chemistry) released in 1931, and a revised edition in 1942; *Introdução à Química Orgânica* (Introduction to Organic Chemistry) in 1944 and 1951; *Introdução à Química-Física* (Introduction to Physical Chemistry) in 1946 and 1955. He also published *Organic Chemistry* (Organic Chemistry) in 1938 together with António Pereira Forjaz and Ferreira de Mira. In 1953, he published individually *Lições de Bioquímica Orgânica* (Lessons on Organic Biochemistry).

Jacobsohn was appointed to various posts at the University of Lisbon: Secretary to the Faculty of Sciences, between 1956 and 1960; Librarian, between 1962 and 1964; Director of the Laboratory of Chemistry, in 1964, and Vice-Chancellor of the University of Lisbon, between 1966 and 1970.

In addition to his teaching activities, Kurt Jacobsohn held other posts associated with research: Director of the IRC in 1958, Deputy to the Junta de Energia Nuclear (Nuclear Energy Committee), in the 1960s, in matters pertaining to the organization of scientific meetings focussing on the application of radio-isotopes.

In 1974, he retired from teaching, but continued to carry out research. In 1976, the IRC began being affected by the financial problems arising from the nationalisations, following the 25 April Revolution 1974, and its staff was much reduced. At this point, the Institute established an agreement with the Instituto Nacional de Investigação Científica, (INIC, National Institute for Scientific Research) in order to ensure its survival. In this context, the Centro de Estudos de Bioquímica e Fisiologia Animal da Universidade de Lisboa (Centre for Biochemical Research and Animal Physiology of the University of Lisbon) was created. In 1977, Kurt Jacobsohn was appointed Secretary-General to this research centre and director of two research projects, one on enzymology and the other on lipid metabolism, which he led until 1979.

Kurt Jacobsohn was member of various scientific societies created by the research school of Marck Athias, a former professor at the Faculty of Medicine of Lisbon: the Sociedade Portuguesa de Biologia (Portuguese Society of Biology) of which he became Secretary, and the Sociedade Portuguesa de Ciências Naturais (Portuguese Society of Natural Sciences). He was also member of the Sociedade Portuguesa de Química e Física (Portuguese Society of Chemistry and Physics) of which he became President and Secretary-General, and of the Société de Chimie Biologique de Paris. From 1929, he became member of the editorial board of the *Archives Portugaises des Sciences Biologiques*, and from 1945 he became editor for Portuguese and Spanish speaking countries of the Dutch periodical *Enzymologia*, published by Carl Oppenheimer. In 1947, in addition to being a regular contributor he became adviser to the American periodical *Archives of Biochemistry*, and from 1949 of the Swiss periodical *Vitamine, Fermente, Hormone*, published by Emil Abderhalden, the *Experimental Medicine and Surgery*, published by Bruno Kisch in the USA, and of the *Biological Abstracts*, in which he reported on the work of Portuguese biochemists, upon invitation of the University of Pennsylvania.

During his 50 years of scientific activity in Portugal, Kurt Jacobsohn created a research school of biochemistry at the IRC. He gathered together medicine and chemistry students, and developed an innovative research programme on enzymology which earned him international recognition. In the 1930s, the investigations carried out by his school were quoted in the main treatises on enzymology published abroad. In the next years, he consolidated the scientific tradition inaugurated by his group, which provided the basis for the institutionalisation of biochemistry at the Faculty of Sciences of Lisbon. In the 1960s biochemistry began to be taught to students of the *licence* in Physical-Chemistry, and in 1982, the first *licence* in Biochemistry was established.

Following his retirement, in addition to his pensions from the Science Faculty and the IRC, Kurt Jacobsohn was given a supplement from the German federal government, as a reward for his scientific career. In 1963, he was given a decoration by the German federal government for his role in tightening the academic relationships between Portugal and Germany.

In 1980, Kurt Jacobsohn decided to move to Israel and joined his eldest daughter, Renata. He lived there until 1991, the year he died in Haifa, on 22 September.

Scientific Contributions

Kurt Jacobsohn published around 300 works, ranging from scientific papers and textbooks to popularisation articles. The scientific articles were associated with the research programme of his school, developed between 1919 and 1979. They followed closely the development and changes, which occurred in biochemistry from the conceptual and methodological point of views, in Europe until World War II. Kurt Jacobsohn began his scientific career in Germany as an organic chemist. In this context, he researched on chemical synthesis and identified new glycosides, some unknown phosphoric esters of hydro-aromatic alcohols, of cholesterol and of heterocyclic aromatic phenols. In these investigations he concentrated on questions of asymmetry, and managed to separate racemic alcohols through their glycosilation. These studies were completed enzymatically.

When he arrived in Lisbon in 1929, Jacobsohn tried to free physiological chemistry from medicine, given his expertise in biochemistry. He assumed that the understanding of the complex mechanisms regulating life were only possible by conjugating biological and chemical interpretations. In this context, it was the mission of the biochemist to choose as the object of his enquiry the simplest and intelligible phenomena, in order to draw conclusions from them taken as models, and compare them with similar phenomena. By having simplicity as a principle, Jacobson focussed on cell metabolism, in particular the enzymes intervening in these processes. Amongst the biocatalysts known in those days, he gave priority to a group of enzymes, the alkenoicases, whose characteristics allowed for kinetic investigations, and whose quantification was made through polarimetry, fluorimetry, spectrophotometry and rotatory optical dispersion. The enzymes participated in metabolic fermentation of glucoses, in accordance with the schemes put forward by Szent-Györgyi and Krebs, by effecting the transition to fatty acids and amino acids metabolism.

The systematic enzymological study was carried out by focussing on the action of optical active enzymes on unsaturated acids: fumarase, aspartase and aconitases. In addition to these enzymes, Jacobsohn's research school focussed on another kind of enzymes, the esterases, such as colinoesterase, thiaminase, phosphatase, urease, glicerophosphatase and tyrosinase. Studies on the catalyses of certain enzymes in physiological context and in pathological situations, notably caused by illness, post-surgical lesions, and pharmaceuticals were also carried out. Various tests were made about structural specificity, which not only confirmed this property in enzymes, but also contributed to their classification in accordance with the capacity of fixation of water, ammonia, hydrazine, among other organic compounds, by the double bond; conclusions were drawn about enzymatic affinity. These results were fundamental to the understanding of enzymatic kinetics and to the identification of different factors which affect Michaelis-Menten speed constant in different enzymes. This was the reason why the main treatises on biochemistry of this period referred to these investigations. In addition, they were also important to enzymatic nomenclature.

Kurt Jacobsohn pioneered in Portugal the use of isotopes as markers in biochemical studies. He introduced the "deuterium" on various substrates by fermentation and researched on the kinetics of the altered reaction, which allowed him to draw conclusions on the affinities of the enzymes under investigation. By using this technique, Jacobsohn's research school investigated the influence of various ions on particular pathways of lipogenesis in order to analyse the regulatory processes involved in lipid metabolism. The school played an active role in the establishment of the metabolic map, not only through the identification of different enzymes and metabolic pathways, but also in the interpretation of regulating phenomena.

Kurt Jacobsohn introduced biochemistry in Portugal as a discipline in the boundaries of medical physiology and organic chemistry and was one of the few teacher-researchers that the Faculty of Sciences of Lisbon had in those days, which may explain why his contributions did not always deserve the just credit.

Publications

From the vast number of publications of Kurt Jacobsohn, the following were singled out:

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