



Education Sector

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In the history of Department of Biochemistry of Istanbul Medical Faculty (1933–1957) three German scientists; Werner Lipschitz, Felix Haurowitz and Zdenko Stary

İstanbul Tıp Fakültesi Biyokimya Bölümü tarihinde (1933–1957) üç Alman bilim adamı; Werner Lipschitz, Felix Haurowitz ve Zdenko Stary

Abstract: Escaping from the chaotic environment of Germany before World War II, several scientists, some of whom were biochemists, took refuge in Turkey and made huge contributions in the preparations of new university reforms beginning in 1933. During this period, three well-known biochemistry scholars, Werner Lipschitz, Felix Haurowitz and Zdenko Stary were accepted into the Biochemistry Institute of Istanbul University, and each one of these scientists became the head of this institute respectively. Being at the zenith of their careers, these three scientists spent their most prolific years in the Biochemistry Institute. The first biochemist taking charge of the reforms, Werner Lipschitz, established a fully equipped laboratory during his term in his own right and with the support of some officials. During his stint, he published several articles and a biochemistry book. However, Lipschitz had to challenge some difficulties such as learning Turkish and finding qualified Turkish assistants. Felix Haurowitz and Zdenko Stary, on the other hand, learnt Turkish in a short time and gave their lectures in Turkish. Conducting many studies, encouraging their Turkish assistants to involve in most of these studies and training them attentively, these academicians emphasized the importance of the graduate 'PhD' education and tried to give education to all of their

assistants. They gave lectures in several fields, designed courses and attracted attention to the science of biochemistry. Besides, they published biochemistry books in Turkish. Thus, they made contributions to the development of scientific mentality in the field of biochemistry in Turkey.

Keywords: Werner Lipschitz; Felix Haurowitz; Zdenko Stary; establishment of the Istanbul University Biochemistry Department; history of biochemistry

Özet: 1933 Üniversite Reformu sürecinde Almanya'nın II. Dünya Savaşı öncesindeki kaos ortamından kaçarak Türkiye'ye gelen bilim insanları arasında biyokimyacı akademisyenler de vardı. Bu dönemde Türkiye'ye gelen üç biyokimya hocası İ.Ü. Tıp Fakültesi Biyokimya Enstitüsü'nde, peş peşe Enstitü Başkanı sıfatıyla görevlendirilen; Werner Lipschitz, Felix Haurowitz ve Zdenko Stary idi. Her üç biyokimya hocası da ülkemize gelirken bilimsel kariyerlerinin zirvesindeydiler ve en verimli çağlarını Biyokimya Enstitüsü'nde geçirdiler. Reformla birlikte gelen ilk biyokimyacı olan Ord. Prof. Dr. Werner Lipschitz kendi gayreti ve devletin desteğiyle, bir buçuk yılda, zamanına göre mükemmel denilebilecek laboratuvarlar oluşturdu. Burada bulunduğu süre içinde bir çok makale ve bir biyokimya kitabı yazdı. Ancak Lipschitz Türkçe öğrenme ve Türk vatandaşı asistan bulma konularında sıkıntı yaşadı. Ord. Prof. Dr. Felix Haurowitz ve Zdenko Stary ise, çok kısa zamanda Türkçe öğrendiler ve derslerini Türkçe olarak verdiler. Yüzlerce bilimsel çalışma yaptılar, bu çalışmaların çoğuna Türk vatandaşı olan asistanlarını da ortak ettiler ve onları mükemmel şekilde yetiştirdiler. Doktora yapmanın önemine vurgu yaparak bütün asistanlarına

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Doktora yaptırmaya çalıştılar. Farklı yerlerde Biyokimya ile ilgili konferanslar verdiler, kurslar düzenlediler ve biyokimya bilimine dikkatleri çektiler. Ayrıca, Türkçe biyokimya kitapları yayınladılar ve ülkemizde biyokimya alanında gerçek bilim ve bilimsel çalışma zihniyetinin yerleştirilmesine katkı sağladılar.

Anahtar Kelimeler: Werner Lipschitz, Felix Haurowitz; Zdenko Stary; İstanbul Üniversitesi Biyokimya Bölümünün kuruluşu; biyokimya tarihi

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Introduction

After the foundation of Turkish Republic in 1923, the modernization of all institutions including educational, economic, judiciary, political, and social establishments was initiated by the President Mustafa Kemal Atatürk [1]. In the same token, the modernization of the higher education during early republican period began with the conversion of Ottoman University (Darülfünun) to new modern university, Istanbul University after the new university reform of 1933 [2]. Thus, this new reform allowed to foreign scholars to give lectures at Turkish universities and the German scientists fleeing from the persecution of Nazi Germany started to be employed at the Istanbul University [3]. The removal of 95 scholars from their academic posts by the Nazi regime due to political reasons, and their settlement in Turkey thanks to the invitation of the Turkish government, has been a topic of interest in a number of studies [4,5]. Among the invitees, there were several medical scholars who played a large role in westernizing the new Turkish Republic's medical practice and research as well as education of biochemistry and their curricula [6]. Almost overnight, the University of Istanbul was considered to be the best German university in the world. Historians of higher education might have difficulty in understanding this sort of qualitative transformation established at large scale at the national level in a short time span. One country's great loss was another country's gain, and a third country (USA) had to wait the time when these scientists migrate there to make a stride in the fields of biochemistry and immunology [7,8]. In this review, we aimed to reveal and evaluate the contributions of three German directors of the Institute of Biological and Medical Chemistry (old name) who were considered as worldwide authority in their own fields of science.

Additionally in this study, development of the Institute, Biochemical education and scientific researches performed during their stay in Turkey and the academic staff they trained in the Department of Biochemistry from beginning of the University Reform in 1933 to 1957 has been presented.

Methods

In this article, doctoral thesis prepared by Sukru Aras is the main reference source in the preparation of this study [9]. Furthermore, the other important reference materials applied during the study are the archives of the deanery of Istanbul Medical Faculty and History of Medicine and Ethics Departments of Istanbul Medical Faculty. In addition to historical data and resources, studies used as reference in this article were selected with an approach based on a comprehensive literature review by using MEDLINE/PubMed and Google Scholar databases which were scanned in January 2015 without any restrictions. For each database, the review terms used are 'Werner Lipschitz', 'Felix Haurowitz' and 'Zdenko Stary'.

Ord. Prof. Dr. Werner Lipschitz (1892–1948)

In this period, one of the first leading scientists who fled from Germany to Turkey was Prof. Dr. Werner Lipschitz, born in Berlin on 28 March 1892 (Figure 1). After having completed his secondary and Gymnasium education in Berlin he started to study chemistry and medicine in Freiburg and Göttingen universities and graduated in 1916. After received PhD title in 1915 with the thesis entitled "Optically active N-mono-methyl derivatives of alanine, leucine, phenylalanine and tyrosine", he was given the opportunity to continue his studies together with Emil Fischer at the Chemical Institute of Berlin University in the years of 1916–1917. He was accepted to the University of Frankfurt and worked there as an assistant in Pharmacology Institute in 1918, and after completing his thesis entitled "About the mechanism of toxicity of aromatic nitro compounds" he became associate professor of pharmacology in 1920 [9,10]. Then, Dr. Lipschitz was appointed as the deputy director of the Institute in 1923 and became professor in 1925. After receiving the title of Professor-in-ordinary he was invested with the directorate position of the university's Institute of Pharmacology in 1926 [11,12]. When the political turmoil took Germany in its grip, Prof. Lipschitz was continuing his studies at the faculty of phar-



Prof. Dr. Werner Lipschitz (1933-1939)



Prof. Dr. Felix Haurowitz (1939-1948)



Prof. Dr. Zdenko Stary (1949-1957)

Figure 1: Three German professors, who served as director in the Department of Biochemistry of Istanbul Medical Faculty, in the between 1933–1957.

macology department of Frankfurt School of Medicine. In 1933, Biological and Medical Chemistry department of the Istanbul University invited him to Istanbul to take charge of directorship of the Institute. He accepted this offer and became the director of the institute [9]. Prof. Dr. Lipschitz set to establish a modern laboratory by procuring modern tools and equipment. In 1934, Paula Schwerin, Ernst Buding, and Gitla Lisie Anhegger came to Turkey from Germany and started to work as his assistants, and studying together did some scientific researches and publications in the field of biochemistry and pharmacology between 1935 and 1939 [9]. He also wrote a biochemistry book called ‘Physiological and Medical Chemistry Courses’. After his contract time as directorate of Institute according to the agreement, October 1939, came to an end, he went to the United States in the same year. He began working as a chemist in the ‘Lederle’ pharmaceutical factory and developed a new mercury-free diuretic. Lipschitz, while continuing his studies, was infected with a virus and died in 1946 [9,10]. Prof. Lipschitz, before coming to Istanbul University, had 75 scientific publications between 1913 and 1933. While in Turkey, he published 15 papers, and after leaving Turkey, he also published 15 papers. Furthermore, he had seven books all published in German. For some reason, unlike the other authors no Turkish researchers took part in his publications. The reason of this was that he could not make up his own permanent research team to be able to work together as well as the fact that the time of his stay was the constitution years of the institute.

Ord. Prof. Dr. Felix Haurowitz (1896–1987)

Felix Haurowitz, born in Prague on March 1st, 1896, was drafted into the Austrian army in 1915, and sent to the Austrian front during World War I (Figure 1). In 1918 he was allowed to leave from the army for enrolling in the medical school of the German University in Prague [9]. He was subsequently granted a year’s leave by the government to obtain a medical degree that he received in 1922. After receiving his M.D. in 1922, Haurowitz was awarded with the title of “Dr. rer. nat.” (D.Sc.) in 1923. During the period -from 1925 through 1936- of research on hemoglobin in Prague, Haurowitz made a number of fundamental discoveries [13]. In 1938 while working at the German University in Prague, he researched hemoglobin and its derivatives. After that, he began to study on his popular work, ‘Progress in Biochemistry’. In fact he had chosen immune-chemistry as his principal field of research since 1930. The conditions for Haurowitz dramatically changed in 1938. He found a way to escape from Prague two weeks after the invasion of Czechoslovakia [9,12,13]. Just then he received an offer for the directorship of biochemistry department at the Istanbul University. For the Turkish government, faithful to the policy of modernization initiated by Atatürk, these recruitments was an opportunity to increase the standards and quality of higher education in Turkey. Though being reluctant to leave Prague, Haurowitz decided to visit Istanbul. Since he found the conditions favorable, he accepted the Turkish offer and the Haurowitz family came to Turkey in 1939 [13,14]. In

FELIX HAUROWITZ	
ACADEMIC HISTORY AND HONORS	
DEGREES	
1922	M.D., German University of Prague
1923	D.Sc., German University of Prague
HONORARY DEGREES	
1973	M.D., University of Istanbul
1975	Ph.D., Indiana University
UNIVERSITY APPOINTMENTS	
1920–25, Assistant; 1925–30, Docent; 1930–39, Assistant Professor, Department of Physiological Chemistry, Medical School of the German University, Prague	
1939–48, Professor and Head, Department of Biological and Medical Chemistry, Medical School, University of Istanbul, Turkey	
1948–58, Professor of Chemistry; 1958–66, Distinguished Professor, Department of Chemistry, Indiana University, Bloomington, Indiana	
MEMBERSHIPS	
1960	Deutsche Akademie der Naturforscher Leopoldina
1970	American Academy of Arts and Sciences
1975	National Academy of Sciences
AWARDS AND HONORARY MEMBERSHIPS	
1960	Paul Ehrlich Medal and Prize, Paul Ehrlich Foundation, Frankfurt, West Germany
1971	Award for Distinguished Services to Immunology, First International Congress of Immunology, Washington, D. C.
1972	Société de Chimie Biologique, Paris
1973	Société d'Immunologie, Paris

Table 1: Felix Haurowitz' short academic history and honors (Putnam FW. Felix Haurowitz. A Biographical Memoir. Natl Acad Sci. 1994; page 149).

April 1939, Haurowitz became Professor and Director of the Institute for Biological and Medical Chemistry. By the end of the second year he learnt Turkish enough to teach and examine in Turkish, and published a book on biochemistry in this language [15]. He reserved much of his time in teaching comprehensive scientific studies and laboratory courses in spite of inadequate budget allocations because of war. Still, he spent his other remaining time from his lectures in his laboratory, and, he published a number of articles in international journals, as well as in Turkish journals in this period [9,13]. Because of the economic hardships, government could not permit academicians to buy foreign publications; Prof. Haurowitz complained about the inability of getting copies of journals published in Holland, even the issues including his articles [15]. Despite the progress made in research, the good life in Istanbul, and the satisfaction gained from the contribution he made to the development of medical education and extension of health care in Turkey, he had concerns about the future of his children reaching to college age. In 1946 his family, his wife and two children, moved to America. However, Haurowitz decided to stay in Turkey for more two years to fulfill his contract and survive financially [9,13]. When Haurowitz visited his family in 1947, he gave a lecture at Indiana University. In 1948 he received the title of the professor of chemistry, and spent the rest of

his very productive career in Indiana University. In Bloomington, Haurowitz's researches were almost entirely devoted to immunochemistry, but in addition to teaching courses in biochemistry and protein chemistry, he found time to write several books. Prof. Haurowitz, received the title 'Distinguished Professor' in 1958 thanks to his successful academic studies and remarkable scientific achievements [13]. Although he retired from the university in 1966, he continued his scientific activities. Noteworthy, announcement about Haurowitz by his former students at the Indiana University said; "He will officially retire from the faculty this year, but without doubt he will remain as energetic and productive as ever" [14]. In 1971, he was honored at the First International Congress of Immunology for 'his distinguished services to immunology' (Table 1). After forty years of research and teaching, and publishing some 350 articles and eleven books, Felix Haurowitz was 70 years old when he was retired [9,13]. His wife Gina's death in June 1983 left him alone. In his autobiography for the Academy he wrote, "Teaching, doing research, writing books and keeping myself up to date with biochemical research done elsewhere was a full-time job. I would not have been able to do all this without the help of my wife". The distinguished scientist; Prof. Dr. Felix Haurowitz, who made significant contributions to biochemistry, science and humanity, died at the age of 91 in the USA in 1987 [9,13].

His contributions had profoundly impacted the biochemistry department at the Istanbul University, and he has never forgotten. After moving to the United States, he had come to Istanbul three times because of different reasons, and Haurowitz remained in contact with Turkish scientists and students for a long time (Figure 2). In 1953 Haurowitz invited his junior colleague Mutahhar Yenson to join him at the Bloomington laboratories of the Indiana University [16,17]. Haurowitz' the first article was published in the 'Z. Physiol Chem', the oldest biochemical journal in the world, in 1920. Prof. Dr. Haurowitz who had 125 published articles before 1939 published a total of 63 articles after coming to Turkey, 38 of which were printed in Turkey between 1939 and 1948 and other 25 after leaving Turkey. In 33 of these works including some abstracts, the Turkish researchers also were observed among the authors in scientific publications. After his departure from Turkey, academic productivity increased much with the contributions of Prof. Dr. Haurowitz, until 1979, and the number of published articles reached to 350. Except for 1921, it seems that one or more articles were published for one year until 1974, and the last article was published in 1979 according to the PubMed records [18]. From Istanbul University, including his students and assistants such



Figure 2: Prof. Dr. Felix Haurowitz with former students and colleagues from Istanbul Medical Faculty, while visiting to the Department of Biochemistry in 1975.

as Mutahhar Yenson, Sevket Tekman and Fahamet Bursa, 6 different Turkish authors (in the 9 papers) are found in these 66 articles written between 1943 and 1979 (Table 2). On the other hand, the vast bulk of Haurowitz’s trilingual (German, Turkish, and English) correspondence with his colleagues starting in the mid-1920s and continuing through the 1960s has been archived at the Lily Library of Indiana University [19].

Ord. Prof. Dr. Zdenko Stary (1899–1968)

Zdenko Stary, born in Prague in 1899, completed his primary and secondary education in 1917 (Figure 1). After

completing his medical education, starting in 1918, at the faculty of medicine of Prague German University in 1923 he received the title of ‘M.D.’ [9]. He, an assistant at the Institute of Biochemistry in 1925, received the title of PhD in the field of biochemistry. Then he was given the title of associate professor in 1928 and professor of Biochemistry in 1939. Prague German University Faculty of Medicine appointed him in 1939 as director of the Institute of Biochemistry and he held this position until 1945. After the closure of the University of Prague in 1945 he came to Turkey in 1947 and started his career as a professor of biochemistry at the University of Ankara [9]. In 1948 while Prof. Dr. Haurowitz was leaving from Turkey, he recommended Prof. Dr. Zdenko Stary for his position. He accepted the invitation (1949) of

Table 2: The number of articles published by each professor with Turkish authors.

	Werner Lipschitz	Felix Haurowitz	Zdenko Stary
The number of articles published in PubMed/with Turkish author	Data could not be reached	66/9*	42/29*
Published articles, while in Turkey/with Turkish author	15/–	63/25	45/29
Indexed in the other journals with Turkish author	–	8	13
Published articles in local journals (or prooceding books) with Turkish author	–	17	16

*Pubmed records on the web.

Biochemistry Institute of Faculty of Medicine of Istanbul University and began this task on the date of when Prof. Dr. Haurowitz departed [6,9]. Although other names from Germany were also considered as prospects for this position, Professor Stary was appointed to this position by the board of professors and Istanbul University senate because of his previous studies with Prof. Haurowitz in Prague and his good command of Turkish (April 1948). After the maturity of his contract with Medical Faculty of Ankara University (Dec, 1948), he began to work at the Istanbul University. At the end of 1951, his contract was extended for next 5 years under the recommendations of the evaluation commission. In 1957 while leaving the institute, he said good bye with the words: "I will always be with my school, and I am witnessing how quickly this school is making progress, I am very proud of being a member of this family." In the United States Prof. Stary worked in Warren State Hospital (Pennsylvania) during his stay and died of a heart attack in 1968 [9,20].

Prof. Stary exerted great effort on the practical and theoretical education of his students and sacrificed his time to the progress of the science of medicine. Before coming to Turkey, Zdenko Stary had 74 publications; the first article in PubMed record was published in the Nature in 1946. After occupying the position in a short time (1949–1952), he produced huge variety of publications in total of 24 works, which include 10 original studies, 6 reports, 7 reviews, 2 books and 2 conference papers [6,9]. In addition he gave his lectures in Turkish and worked in collaboration with his Turkish colleagues. This shows how sincere and desirous working environment there was in the university where he worked. The abstracts of 100 articles published in German and American magazines four of which were in Turkish were prepared with the contributions of Dr. Stary who considered his assistants as partners. Prof. Dr. Stary also edited academic dissertations and doctorate theses through scientific aspect; 8 Biochemistry dissertations, 5 doctoral (PhD), and 3 associate professor theses [9]. While in Turkey, Stary's 60 scientific publications, and 'Medical Biochemistry' and 'Biochemistry lectures' books were published. He researched proteins, and the chemical composition of body fluids, and developed a new method for screening the albumin/globulin ratio. In terms of scientific studies that made contributions to the internationally recognition of the Istanbul University, and Prof. Stary's some biochemical and toxicological studies were published in the 'Sammlung von Vergiftungsfaell' and 'Physiologisch Chemie'. Prof. Stary's two important articles on the 'glycoproteins and muco polysaccharides' were published in Clin Chem 1957, and Ergeb Physiol in 1959 after leaving Turkey [9].

According to PubMed record, it was observed that many Turkish authors (80%) three of whom -Bursa F, Bodur H, and Tekman S- were common in the Prof. Stary's publications. Some publications in Turkish (1951–1955) were published in the Journal of Istanbul Medical Faculty (former name; Istanbul Tip Fak. Mecmuasi). On the other hand, some articles written in German were published in the German journals such as: Klin Wochensch and Munch Med Wochensch. After taking Prof. Stary's farewell of the institute, Prof. Dr. Mutahhar Yenson was appointed to this position. Prof. Dr. Mutahhar Yenson, being the first assistant of the institute of biochemistry -a graduate of the Medical Faculty of Istanbul University- had worked together with all three distinguished scientists [6,9].

Discussion

Institute of Biochemistry in Faculty of Medicine of Istanbul University, the first and only biochemistry institute in those years. Three foreign professors assumed very critical responsibility not only in the constitution of the Institute but in the training of Turkish scientists as well. Istanbul University, founded as a school in 1933, was reorganized as an Institute of Biochemistry between 1933 and 1957. In this period, one of the first leading scientists Prof. Dr. Werner Lipschitz, the planning of the Institute's activities, which laid the foundations of academic restructuring process, 'Physiological and Medical Chemistry lectures' books made significant contributions to the department and the students as well as projections of the studies to be conducted in the institute [6,9]. Prof. Dr. Felix Haurowitz was well known in Europe, and 1938 and 1939 were scientifically the most prolific years for him. In spite of these achievements, Haurowitz felt himself in exile during his early years in Turkey. Nevertheless, two years later, he was able to lecture in Turkish and published many papers and also a textbook on biochemistry that went through several editions in this language [13]. However, he preferred studying on the subjects requiring unsophisticated and inexpensive materials, such as immunochemical experiments in Turkey along those years. His article on 'Chemistry and Biology of Proteins' was probably written as the consequence of this forced partial inactivity in research [21]. Unwillingly, he had to interrupt his research, and spend much of his time in teaching foreign languages and reinitiating new researches in difficult conditions in spite of the challenges in keeping in touch with the scientific community. However, he trained a generation of Turkish biologists and doctors some of whom later became pro-

fessors in Istanbul and other Turkish universities [6,9]. An article written by Prof. Haurowitz with the participation of his assistants Schwerin P, Yenson M who devoted himself to education, research and productivity and which was published by The Journal of Biological Chemistry shows the institutional affiliation between the Institute of Biological and Medical Chemistry, and Istanbul University in 1941 [22]. In later years, Prof. Haurowitz continued to work together with his colleagues from Istanbul University and some researchers from other universities in the United States. He always kept in contact with his assistants and the institutions in Turkey after migrating to America. In 1973 the University of Istanbul honored him by conferring the honorary degree of doctor of medicine [13]. Prof. Dr. Zdenko Stary, the last scientist who worked in Biochemistry department, followed the path of Haurowitz while running the institute. Apart from his hands-on education Prof. Dr. Stary's teaching courses called 'Medical Biochemistry 1, 2' and 'Biochemistry Courses 1, 2' which were printed in Turkish made significant contributions to his students' progress. At the start of research and development in the field of biochemistry, Institute of biochemistry laboratories undertook a pivotal task in the training of researcher and then these trained academicians were brought in the positions of planning of the newly established universities. In particular, after the 1940s, many Turkish authors began to publish articles in national and international journals with the support of Prof. Dr. Haurowitz and Prof. Dr. Stary (Table 2). These three biochemist scientists who came to Turkey conducted very successful scientific studies. But Haurowitz, the most lauded one among these three scientists, is widely recognized as a major 20th century contributor to biochemistry and immunology. Moreover, his researches addressed the fundamental questions of life itself and his contributions have had profound impact on science and humanity. As a result of the modern methods and techniques they applied in the biochemistry education and training, the number of books, which were published and taught in the Universities and the libraries, increased during their stay. In addition, the translated and copyrighted works were also brought to Turkey by those foreign scientists to be used for tertiary education, as well as many scientific paper published by them. Each of biochemistry scientists who came to Turkey conducted very successful studies and assumed essential roles in the establishment of the department of biochemical sciences. When the past and present situations of the science of biochemistry are compared, the contributions to this field of these foreign scientists who came to Turkey during the university reform are to be appreciated. Many scholars who are students of

these three scientists were employed in different departments of the university such as the Cerrahpasa and Istanbul medical faculties, the school of pharmacy, and faculty of science and letters; some graduates were appointed to important positions in other universities constituted in different cities. As of today, thirty five lecturers completed all requirements and education to get professoriate degree from the Department of Biochemistry of Istanbul Medical Faculty. Still some of them are actively immersed in ongoing research adventure. If they had not come to Turkey then, the progress made in biochemistry, today, could not have reached at this level. We want to thank and express our respect to these distinguished scientists for their valuable contributions to the field of biochemistry.

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