Profiles in Cardiology

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Wilhelm Raab

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Lack of physical exercise, resulting from motorization, automation, television sitting, and from the nearly universal availability of a multitude of labor saving devices, has become one of the most conspicuous characteristics of 20th Century Western civilization.—Wilhelm Raab

Dr. Wilhelm Raab, born in Vienna, Austria on January 14, 1895, is a descendant of an aristocratic family with a long medical and artistic tradition (Fig. 1). His grandfather was Dean of Medical Faculty and editor of *Pharmacopeia Austriaca*, and his grandmother Isabella, the daughter of the famous graphic artist Doré who tutored the emperor Franz-Joseph in French, was the niece of Schubert's friend Franz von Schober.¹ Dr. Raab's proficiency in drawing, playing the violin, composing poetry, and his multilingual fluency might have been inherited from the artistic, musical, literary, and linguistic tradition of his progenitors. His mother died when he was 4 years old, and to this tragic event of his childhood he attributed his resolution to become a physician.¹

Dr. Raab received his M.D. degree in Vienna in 1920, and immediately plunged into the field of experimental physiology and pathology in Vienna and Berlin. In 1921 he became an assistant of Professor Biedl (Lawrence-Moon-Biedl syndrome) in Prague. In one of Raab's publications during this time he described the clinical picture of a patient with a basophilic adenoma of the pituitary gland. Cushing cited this case as one of the three cases originating the eponym of Cushing syndrome, which could have been more properly named Cushing-Raab syndrome.¹ Later, while exploring the

effect of hypophysis on lipid metabolism, he isolated the substance lipoitrin. In 1926, Dr. Raab became a Privatdozent in the Department of Professor Karl Wenckebach in Vienna.

His scientific curiosity and scarcity of research funds led him occasionally to perform experiments on himself. One such experiment had a particularly profound effect on his career. While studying the effects of catecholamines on lipid metabolism, he injected himself with a large dose of adrenaline. The initial surge of hypertension was followed by a circulatory collapse and an excruciatingly painful attack of angina pectoris with typical electrocardiographic changes of ischemia and prolonged arrhythmia. His deduction, and the central theme of his future investigations that myocardial ischemia resulted from an imbalance between oxygen supply and demand rather than from pure mechanical obstruction, received confirmation during his lifetime when beta-adrenergic blockade became the cornerstone of antianginal therapy.

In 1929, Dr. Raab was awarded a fellowship by the Rockefeller Foundation in New York in the Physiology Department of Professor Walter B. Cannon at the Harvard Medical School in Boston. There he met his wife, Olga Palmborg, with whom he returned to Vienna. Most of his publications during the subsequent 10 years dealt with various endocrine and autonomic nervous system aspects of hypertension in humans. In 1933, he made an epidemiologic survey of the association between fat, cholesterol-rich diet, and atherosclerosis, and formulated a set of dietary guidelines not unlike those recommended by epidemiologists today. In 1936 Dr. Raab became Chief of Medicine in one of Vienna's teaching hospitals, enjoying the opportunity to combine clinical and experimental work on hypertension and atherosclerosis, but after the Anschluss in 1938, his outspoken hostility to the Nazis and his marriage to an American citizen created difficulties with the Gestapo, forcing him to leave Austria.

In December of 1939, he arrived in the U.S., and was offered the chairmanship of the newly created Division of Experimental Medicine at the University of Vermont where he remained as Professor of Medicine until his retirement at the age of 70. In 1942, he discovered the presence of catecholamines in the brain, and in a series of pioneering publications about the toxic vascular and myocardial effects of catechol-

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FIG. 1 Wilhelm Raab, M.D., 1895–1970.

amines he combined his hypothesis of oxygen wasting by excess of catecholamines with emphasis on the protective role of vagal stimulation. At the same time, less than 100 miles away from Burlington, Vermont, Dr. Hans Selye in Montreal was collecting evidence of the harmful effects of stress. The ideas of these two visionaries interacted, but in Raab's scheme the chief culprit was excessive sympathetic stimulation evidenced by an increased catecholamine release during angina pectoris.

In 1959, Raab organized an international symposium about the effect of catecholamines on the heart and circulation, (several years before the discovery of beta-adrenergic blocking drugs) and in 1964 he organized the first international conference on preventive cardiology.¹ At that time he was engaged in a world-wide campaign aimed at exposing the consequences of physical inactivity (he coined the term loafer's heart) combined with the effects of fat-rich diet, emotional stress, and cigarette smoking. To practice what he preached he walked to and from work, did not use elevators, and exercised half an hour each day. To this he attributed his outliving all of his ancestors by many years. In his autobiographical sketch written in German, Dr. Raab expressed hope that his attempts to formulate the theory of degenerative (ischemic) heart disease would be acknowledged posthumously. He also credited his own tenacity in pursuing his work in spite of the opposition and active resistance of numerous influential critics of his missionary zeal. While focusing on those who opposed his ideas,

he characteristically underestimated his own considerable influence and acclaim, which was apparent from the invitations to lecture in many medical centers on several continents, his ability to attract many research associates, and frequent visits by scientists from European and American countries and from Japan to his laboratory.

After the death of his wife, which occurred while he was retiring, he suffered temporarily from depression, but apparently made a recovery and resumed lecturing. He remarried and accepted a consulting position in Bavaria. On the 22nd of September, 1970, a few days before his scheduled move to Europe, Dr. Wilhelm Raab took his own life at the age of 75 years. His tangible scientific legacy consists of hundreds of articles in the many languages mastered by him as well as of several books. The most important of these are *Hormonal and Neurogenic Cardiovascular Disorders* (1963), *Prevention of Ischemic Heart Disease* (1966), and *Preventive Myocardiology* (1970). From his bibliography I have selected a few references^{2–5} to point out the chronology of his main ideas and emphasize his pioneering role in the development of concepts fundamental to the prevention of atherosclerosis.

I was a member of Dr. Raab's Division for several years, thanks to my association with Dr. Eugene Lepeschkin, whom he had invited to join the faculty in 1949. Not having participated in the experimental work of Dr. Raab's team, I was not directly exposed to the intellectual power of his creative genius but was captivated by his erudition, wisdom, sense of humor, and personal charm. As time goes by and few of Raab's contemporaries are alive today, it appears appropriate to reaffirm his place in the history of preventive cardiology and to commemorate him as a prophetic visionary of today's elementary public health measures.

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