

Contribution of Jan Brod to Nephrology

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Abstract

Jan Brod (1912–1985), Professor of Medicine of Charles University, Prague, was one of the outstanding personalities of the Czechoslovak medicine and European nephrology of the 20th century. He was an eminent clinician, teacher and scientist who belonged among the founders of renal medicine in Europe. He grew up in the scientific tradition of Prague and Vienna and he was trained by some outstanding personalities, particularly Paul Wood. He became famous due to his pathophysiological-clinical approach to hypertension, heart and kidney diseases. He was not only interested in renal and cardiac physiology but in the entire clinical nephrology. He was among the first clinicians who started to use creatinine clearance in routine practice. His early work was also performed in the field of acute glomerulonephritis and in interstitial nephritis. Later he was interested in water and electrolytes in heart failure and the pathogenesis of edema, and he published priority data on the hemodynamic pattern in emotional stress. Furthermore, it is for sure that he was one of the first cardioneurologists, too. As early as in 1950, he studied diurnal variation in renal perfusion and urinary output in heart failure and later the effect of the adrenergic blockade on the renal hemodynamics in heart failure. Up to his exile in 1968, he served as the head of the Institute for Cardiovascular Research based in Prague and later on, up to his retirement, as the head of the Department of Nephrology in Hannover. He was a founding member of the International Society of Nephrology and president of its 2nd congress held in Prague in 1963. Throughout his life, Jan Brod remained a political man who voiced his opinions. Despite two exiles, he was always the Czech patriot. He holds a special place in the history of Czechoslovak and European nephrology.

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Introduction

Jan Brod (1912–1985), Professor of Medicine of Charles University, Prague, was undoubtedly one of the most important and leading personalities of the Czechoslovak medicine and nephrology of the 20th century (fig. 1) [1]. He was an eminent clinician, teacher and scientist, he was one of the founders of academic nephrology in post-war Europe and today, more than 25 years after his death, his name is still commemorated among leading nephrolo-



Jan Brod (1912–1985)

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gists in Europe, Australia and the USA. In particular, he pioneered the pathophysiological approach to kidney and heart diseases and hypertension. His monograph *The Kidney* (in Czech) and later on its English and German editions summarized the current knowledge in nephrology of the middle of the 20th century and up to now it has been an important item of collections of most university libraries throughout the world.

Young Age (1912–1938)

Jan Brod was born in May 19, 1912, in Nový Jičín, a regional town located in North Moravia, as the son of a Jewish business manager. He studied medicine and graduated cum eminentia at the Faculty of Medicine of Charles University in Prague in 1937. He started his professional career as unpaid house officer in the First Department of Medicine in the General Faculty Hospital in Prague. At the end of 1937, he left Prague for Vienna and spent half a year in the outstanding Department of Internal Medicine led by Prof. Hans Eppinger (1879–1946). During his stay, he took up the method of creatinine clearance, which had previously been introduced to practice by Prof. Hans Popper (1903–1988), a Viennese of Czech origin. Popper was considered the founder of modern hepatology, but in the 1930s, he was more interested in renal physiology, particularly in the electrolyte handling. These circumstances initiated Brod's interest in nephrology.

The World War and Paul Wood

The World War II and the Nazi occupation of Czechoslovakia in 1939 complicated the life of Jan Brod substantially, but, on the other hand, it brought him a lot of life and professional experience. In 1938, while he had been waiting in Paris for being granted the Canadian visa, he spent a short time in Hôpital de la Pitié with the famous endocrinologist, Prof. Francis Rathery (1877–1941). After the German invasion to France, Jan Brod enlisted into the Czechoslovak army corps in France and served in the First Aid troop in Compiègne. After France had been drubbed in 1940, he embarked a British cruiser and on June 7, 1940, he landed in Liverpool, UK. There he was trained in military medicine and later on he served in Leamington Spa, Warwickshire, where, apart from other activities, he looked after the victims of the Coventry bombing. In March 1943, he sailed on the ship Windsor Castle to Africa, already being a lieutenant of the British

Medical Corps. Unfortunately, the ship was hit by a torpedo and sank, but Brod survived, was rescued and finally he landed in Algiers. After a 400-km-long journey, he reached Châteaudun-du-Rhumel (today Chelghoum Laïd), where he started to work in the local field hospital. On May 12, 1943, the German army in Africa surrendered and Brod sailed to Italy together with the Allies and served in the 103rd Field Hospital, under the leadership of Paul Wood (1907–1962). Wood was an excellent clinician from Hammersmith Hospital, London, and later in the postwar period he became one of the world's outstanding cardiologists. Among other activities, he introduced the cardiac catheterization. Being exposed to Wood, Brod acquired his clinical skills which eventually resulted in his future reputation as an excellent clinician. In December 1943, he moved with this field hospital to Naples and participated in the famous battle of Monte Cassino. At the end of the war, he was a captain of the British Army operating in south Italy. At this time, he also met Max Rosenheim (1908–1972), another outstanding physician, and he was interested in acute glomerulonephritis. In October 1945, Brod was demobilized and returned to the First Department of Medicine in Prague.

Prague and the Institute for Disorders of Circulation (1951–1968)

His ardor and drive brought him to pass the fellowship to Prof. G.W. Pickering (1904–1980) in London who was particularly well known in the research of hypertension. Later Brod got a fellowship of the Rockefeller foundation, which he spent in New York with Dr. Homer Smith (1895–1962), who was a founder of modern kidney physiology. He discovered inulin and his experiments on the kidney in the 1930s proved beyond any doubt that it operated according to physical principles, both as a filter and a secretory organ. Smith authored several books including *The Kidney. Structure and Function in Health and Disease*, which was considered to be a 'study bible' for nephrologists for many decades.

In 1951, Jan Brod left Charles University and became vice director and later, since July 1, 1961, the head of the Institute for Cardiovascular Research based in Prague. There he attracted a number of young enthusiastic physicians and within a short time the Institute gained an outstanding reputation at home and abroad. Brod became famous in medicine particularly because of the new pathophysiological approach to cardiovascular diseases and because of studying diseases in clinical practice as

well as experiments. Despite his scientific success, he remained a dedicated clinician. His clinicopathological conferences were felt to be on a par with the great medical establishments in Vienna, Berlin and London. In 1963, he became a full professor of medicine. This period was probably the climactic point of his professional career and many extraordinary studies were carried out in the field of hypertension, kidney diseases, atherosclerosis, and heart and lung circulation, many of them being quoted till now. This was probably the last time such a clinical, research and educational center was established in the country, which would serve as a source of so many outstanding personalities in medicine working in Czechoslovakia and consequently in Europe and the USA.

In this period, Brod became secretary of the WHO symposium in 1960. He was one of the founding members of the International Society of Nephrology and the president of its 2nd Congress held in Prague in 1963. He was famous worldwide and was invited to talk in many universities in Europe, the USA, and Australia. Many leading and outstanding nephrologists, physiologists and cardiologists visited Prague and his Institute and furthermore his coworkers and fellows succeeded abroad.

Brod was a leading personality in the Czechoslovak medicine as well as nephrology. In 1958, together with others, he founded the Nephrology Commission of the Section of Internal Medicine of the Czechoslovak Medical Society, which was a predecessor of the Czechoslovak Society of Nephrology. He was the first president of this Commission and of the Czechoslovak Society of Nephrology later on.

The end of the 1960s was for Czechoslovakia a time of high political tension, hopes and expectations of possible political changes. During the 'Prague Spring' in June 1968, Brod, together with other intellectuals, launched the 'Manifest of 2000 Words', a critical document, which asked unsuccessfully for a faster democratization process of the communist regime. But the things turned different. After the Warsaw pact armies' invasion into Czechoslovakia in August 1968, the repression of civil rights into regime opponents started and Brod became an unwanted person for the communistic establishment. Thus he decided to emigrate abroad for the second time and left for Germany [3].

Germany – Hannover (1969–1985)

In exile, for a short time, he worked as a visiting professor in the Department of Nephrology in Mainz led by his friend Peter Wolff. In the following year, in 1969, he

was appointed head of the newly founded Department of Nephrology in the Medical School in Hannover, which adopted successfully the Anglo-American departmental structure. There he continued with the same tireless effort in all his professional activities and the department remained an important place for clinical nephrology, research and teaching. In this period, chronic dialysis and kidney transplantation became important parts of nephrology, but for Brod belonging to the rather older generation of clinicians, chronic dialysis itself remained as 'meta-nephrology'. Besides that, Brod organized in Hannover a number of meetings and symposia visited by many world-leading nephrologists. The first symposium formed the basis for the series *Contributions to Nephrology*.

Brod always loved Great Britain and he highly appreciated his title *Fellow of the Royal Collage of Physicians*. He also became an advisor to the British Military Hospital in Hannover and he even held courses for the British Army Medical Staff. In 1984, he was granted fellowship of the Green College in Oxford and on this occasion he presented a highly prestigious lecture about the course of medicine, history and possible future of the Charles University [4].

He wanted to spend his pension in the town of Leamington Spa, where he bought a house. Unfortunately, in February 1985, at the age of 73 years and shortly after he went into retirement, he died in Celle near Hannover after an acute short illness.

Brod was a person with a wide spectrum of activities and interests. He was fond of classical music, he had many friends among musicians and he was a frequent visitor of opera performances, concerts and other cultural events. He married, at the age of 48, a former medical student from Prague. They have a son, Jan, who studied medicine and became a urologist.

Research and Scientific Work

Throughout his professional life, Brod published more than 200 scientific articles and 2 major monographs, one of them in English, which was translated into many languages and reedited twice (see also Appendix). He was interested not only in renal and cardiac physiology but in the entire clinical nephrology. He was among the first clinicians who started to use creatinine clearance in routine practice. His early work was also performed in the field of acute glomerulonephritis and later in interstitial nephritis and its different etiological factors, particularly infection, reflux and analgesic abuse. Later he was inter-

ested in the topics of water and electrolytes in heart failure and the pathogenesis of edema. He published priority data on the hemodynamic pattern in emotional stress. In particular, he demonstrated that the hemodynamic response to stress in normotensive subjects, with renal and cutaneous vasoconstriction, is similar to the situation in unstimulated hypertensive patients. These findings initiated further studies into the genetic-environmental interaction in hypertension, which remained his main fields of interest throughout the entire life.

Among many other important issues, it is for sure that Brod was one of the first cardioneurologists. As early as in 1950, he studied diurnal variation in renal perfusion and urinary output in heart failure and later on he published his studies of the effect of the adrenergic blockade on the renal hemodynamics in heart failure.

Conclusion

Jan Brod was an eminent clinician, teacher and scientist who belonged among the founders of renal medicine in Europe. He grew up in the scientific tradition of Prague and Vienna and was trained by some outstanding personalities, particularly Paul Wood. He became famous due to his pathophysiological-clinical approach to the hypertension, heart and kidney diseases. Throughout his life, Brod remained a political man who voiced his opinions. Despite two exiles, he was always the Czech patriot, and holds a special place in the history of Czechoslovak and European nephrology.

Appendix: The Most Important Publications of Jan Brod

Brod J, Sirota JH: The renal clearance of endogenous creatinine in man. *J Clin Invest* 1948;27:645.

Brod J, Sirota JH: Effect of emotional disturbance on water diuresis and renal blood flow in the rabbit. *Am J Physiol* 1949;157:31.

Brod J: Acute diffuse glomerulonephritis. *Am J Med* 1949;7:317.

Brod J, Fejfar Z: The origin of oedema in heart failure. *Q J Med* 1950;19:187.

Brod J, Fejfar Z, Fejfarová MH: The role of neurohumoral factors in the genesis of renal haemodynamic changes in heart failure. *Acta Med Scand* 1954;148:273.

Brod J: Chronic pyelonephritis. *Lancet* 1956;i:973.

Brod J, Benešová D: A comparative study of functional and morphological renal changes in glomerulonephritis. *Acta Med Scand* 1957;157:23.

Brod J, Pávková I, Fencel V, Hejl Z: Influence of fasting on the immunological reaction and course of acute glomerulonephritis. *Lancet* 1958;i:760.

Brod J, Fencel V, Hejl J, Jirka J: Haemodynamics in essential hypertension. *Nature* 1959;184:1643.

Brod J, Fencel V, Hejl Z, Jirka J: Circulatory changes underlying blood pressure elevation during acute emotional stress (mental arithmetic) in normotensive and hypertensive subjects. *Clin Sci* 1959;18:269.

Brod J: Some haemodynamic aspects of hypertension and their bearing on the pathogenesis of the hypertensive disease. *Lancet* 1960;ii:773.

Brod J, Fencel V, Heil Z, Jirka J: The relation of the distribution of regional vascular resistances to the level of muscular exercise in healthy subjects. *Cor et Vasa* 1960;2:106.

Brod J, Fencel V, Hejl Z, Jirka J, Ulrych M: General and regional haemodynamic pattern underlying essential hypertension. *Clin Sci* 1962;23:339.

Brod J: Functional aspects of the differential diagnosis of kidney disease. *Postgrad Med* 1963;39:12.

Brod J: Haemodynamic bases of acute pressor reactions and hypertension. *Br Heart J* 1963;25:227.

Brod J, Hejl Z, Hornych A, Jirka J, Šlechta V, Buriánová B: Comparison of haemodynamic effect of equipressor doses of angiotensin and noradrenaline infusions in man. *Clin Sci* 1969;36:161.

Brod J: *Ledviny*. Praha, SZN, 1962, p 1043.

Brod J: *Die Niere*. Berlin, Volk und Gesundheit, 1964.

Brod J: *The Kidney*. London, Butterworth, 1973, p 740.

Brod J: Studies of renal function in the differential diagnosis of kidney disease. *Br Med J* 1971;3:135.

Brod J, Bahlmann J, Cachovan M, Hubrich W, Pretschner PD: Mechanisms for the elevation of blood pressure in human renal disease. *Hypertension* 1982;4:839.

Brod J: The history of medicine at Charles University. *J R Coll Physicians Lond* 1982;16:195.

Acknowledgement

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- 2 Rychlík I, Lachmanová J: *Nefrologie*; in Jirásek V (ed): *Dějiny I. interní kliniky*. Praha, Karolinum, 1996, pp 145–151.
- 3 Woywodt A, Bahlmann J, Haubitz M, et al: From the Prague Spring to a chair in nephrology in Germany: Jan Brod (1912–1985). *Nephrol Dial Transplant* 2004;19:1374–1377.
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