

Gösta Forssell

(1876–1950)

“The creation of the radiotherapeutic clinics is the great contribution of our century to the social fight against cancer.” (1931)²⁴⁰

Carl Gustav (Gösta) Abrahamson Forssell was born on 2 March 1876 in Aspeboda, Sweden. He was the first of seven sons of Carl Abraham Forssell, an agricultural scholar, who also had two daughters. The family’s progenitors were from Järvsä (Gävleborg), north of Stockholm. A brilliant and enthusiastic man with an amiable personality, Gösta Forssell was also tenacious and resourceful. He brought his country to the forefront of nations in the fight against cancer.

Young Gösta attended the Norra Latinläroverket school in Stockholm from which he graduated in 1895. Following his mother’s wishes, he then undertook the study of theology but subsequently turned to medicine. As an undergraduate, he served one year in 1899 under Dr. Thor Stenbeck (1864–1914), a Swedish pioneer of radiology, who within months of Röntgen’s discovery had organized in Stockholm a one-room Röntgeninstitutet (Fig. 5-1). This fortuitous exposure to the newly discovered rays inspired the young student and led him to become one of the outstanding paladins of the fledgling new medical specialty. In 1899 Stenbeck irradiated a patient with a squamous-cell carcinoma of the skin of the nose, and she became one of the first such patients to have been cured by these means (subj. note 5.1). In 1902 Forssell received his M.B. degree from the University of Stockholm and was appointed assistant in radiology at the University of Uppsala. “Anyone who lived these events,” wrote Forssell later, “would never forget the fascination and at the same time the impotence felt by the young physician before the chaos of innovations.”²⁴¹ In 1903 he visited Paris and observed the work of Joseph Antoine Charles Belot (1876–1953)^B at the Hôpital Broca. Belot was already advocating treatment of carcinomas of the skin with blunt

debalancing by curettage and immediate irradiation of the wound with a single massive dose of unfiltered radiations.⁷⁵

Forssell offered his first contributions to the medical literature in the form of studies of normal radiologic anatomy.²²⁹ In 1904 he published a “brief overview” (with seventy-eight references) of observations in roentgentherapy and concluded that only superficial carcinomas could be eradicated by these means.²³⁰ He reviewed the work of Robert Kienböck (1871–1954)^B and discussed the controversial explanations of observed skin reactions. He described the various stages of epilation, inflammation, and blistering of the skin, and the subsequent atrophy, depigmentation, and possible ulceration and necrosis. He also called attention to the H Unit proposed by Guido Holzkmnecht, the dose necessary to produce a light skin reaction, and to Holzkmnecht’s chromoradiometer. The main pragmatic difficulties in dosimetry were the inconsistencies of the “lamp” and the latency of the effects. Forssell, already concerned with the safety of personnel, reaffirmed the recommendation of Heinrich Albers-Schönberg (1865–1921)^B to use a lead cubicle for protection.

The Serafimerlazarettet, the University Hospital of Stockholm, had established a laboratory of roentgendiagnosis in its medical department in 1903. In 1906 the facility was expanded and transferred to the department of surgery under Dr. John Berg (1851–1931), who brought in Dr. Forssell as director. That same year Forssell married Esther Gottlieb, a secretary and translator who shared his interests. They made their home in Djursholm and their summer residence in Starbo (Dalecarlia).

In 1908, with royal financing, Forssell made a prolonged visit to France. He attended the course of

ferred at the Hôpital Saint Antoine in Paris. In the venerable Antoine Bécère, Forssell saw “a teacher capable of offering a critical and didactic presentation of the radiologic experiences, a master who possessed, in depth, the technology as well as the science: a guiding beacon through the reefs.”²⁴¹ He then proceeded to Bordeaux where he spent several weeks enjoying the stimulating influence and engaging personality of Jean Bergonié (1857–1925),^B a leading figure in medical electricity. “His vitality,” said Forssell, “as well as his enthusiasm, transcended to his entourage; in his patients he inspired hope and a wish to live, and in his students a love of science and of the master.”²³⁷ Finally, in the company of Prof. Berg, he visited Dr. Keating-Hart in Marseille to observe his work with electrodesiccation and electrocoagulation. It was being said that these high frequency currents had more than simple destructive effects on neoplasms and their surrounding tissues; in fact, therapeutic combinations of fulguration and radiation were being proposed.²³¹ Although the immunological implications were subsequently abandoned, electro-surgical procedures were to remain a part of the

practice of surgery of malignant tumors for several decades in Sweden.²³²

In 1909 Forssell reported his own experiences in roentgentherapy of cancer of the skin and of the lower lip in eighteen patients. The excessive fractionation of treatments with relatively weak apparatus in the early days was now being replaced by an “expeditious” method of intensive therapy with ten to twelve H units of unfiltered radiations in two applications and an interval of several weeks. In September 1910, Forssell participated in the International Congress of Radiology and of Electricity in Brussels (subj. note 5.2). Forssell and Svante Arrhenius (1859–1927) were the Swedish representatives. The Section on Physics was highlighted by the brief presence of Marie Curie (1867–1934) and the presentation of Ernest Rutherford (1871–1937). A paper on stereoradiography was presented by Charles Lester Leonard (1861–1913) of Philadelphia. A great deal of attention was given to Forssell’s contribution on radiumtherapy of malignant tumors, a report on the treatment of thirty-eight patients.²³³ Using eight silver tubes containing eight milligrams of radium sul-

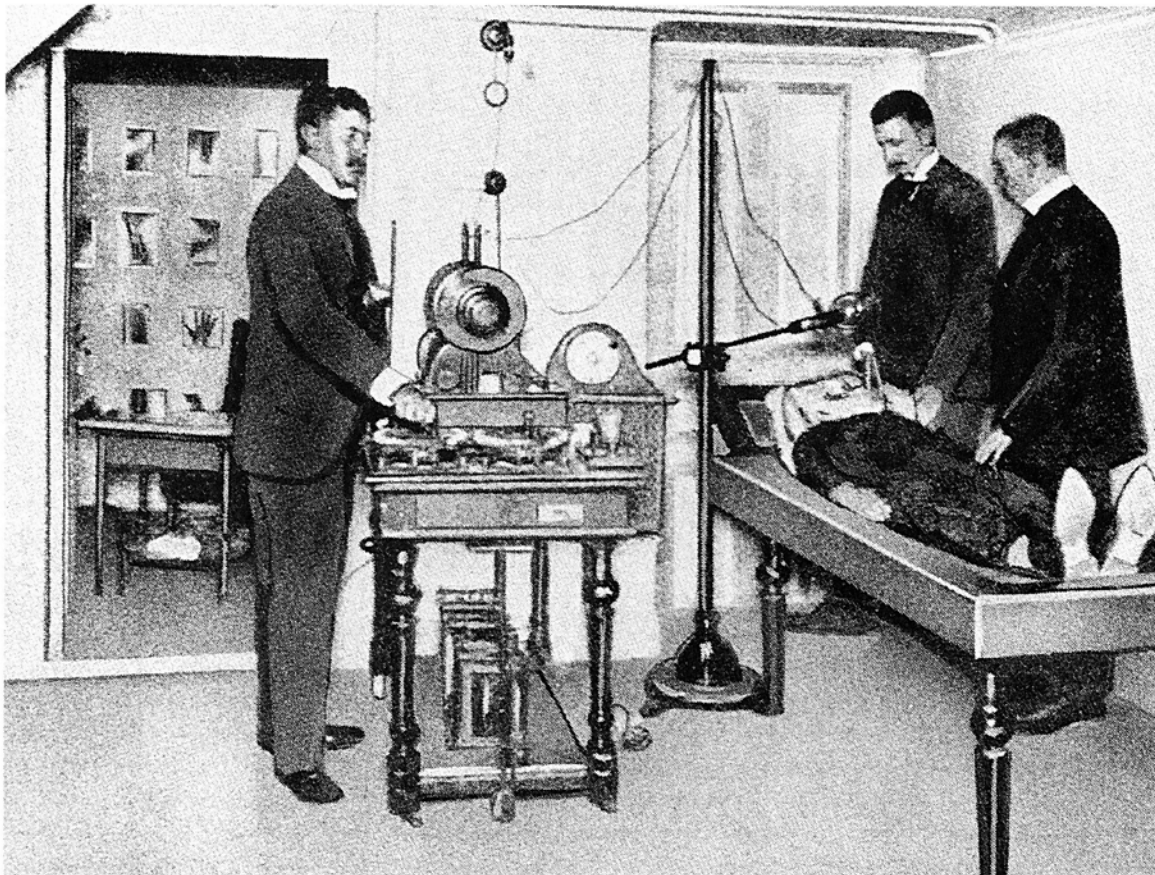


Fig. 5-1. Dr. Stenbeck's Röntgeninstitutet. Dr. Stenbeck stands at left of controls. The tall, dark-haired gentleman in the corner at the head of the patient is Gösta Forssell. (Courtesy of the Radiumhemmet.)



Fig. 5-2. Gösta Forssell (around 1910) when he became director of the Radiumhemmet.

phate, Forssell had adopted the procedures advocated by Louis Frederic Wickham (1861–1913).^{645,657} Wisely, he had also adopted the use of filtration through one or two millimeters of nickel, as advised by Henri Dominici (1867–1926).^B Empirically, Forssell favored an intensive irradiation of twenty-four hours to be repeated after an interval of six weeks: the Stockholm method in embryo. He already recognized the need for interstitial implantation of radium sources under aseptic circumstances for the treatment of other than superficial tumors. Following the Congress and a visit to the International Fair in Brussels, Forssell proceeded to Paris to attend the second International Conference for the Study of Cancer (1–5 October 1910) at which he also presented his recent and brief experience with radiumtherapy of cancer.

On his return to Sweden, Forssell faced another obligation as director of a new institution, modestly but appropriately named the Radiumhemmet, for the treatment of patients with malignant tumors by means of roentgen rays and radium (Fig. 5-2). With the help of private philanthropy, the institution was lodged in an eight-room rented apartment at 10 Scheelegatan (Fig. 5-3). It accommodated sixteen beds, a single roentgentherapy unit, and permitted

the use of one hundred and twenty milligrams of radium. The responsibility for the institute's administration was taken over by the Svenska Cancerforeningen, a national association of which Forssell became the perennial secretary, serving from 1910 to 1926.

In 1912 Forssell presented the promising possibilities of radiumtherapy of malignant tumors of the female genital organs. The treatment consisted of application of one hundred milligrams of radium, filtered through two millimeters of lead, and lasting eighteen to twenty-four hours. This application was to be repeated once or twice at intervals of several weeks. The reported recoveries were then only ten percent of the patients, but the remainder benefited by considerable palliation.²³⁴ The Municipal Council of Stockholm made a grant of half a million crowns to advance the purposes of the Radiumhemmet. Her Majesty the Queen, Victoria, of Sweden headed a collection for a matching fund. In the midst of these events, Forssell found time to gather and present the original data of his doctor's thesis, a radiologic study of the anatomy and physiology of the stomach.²³⁸

When the increasing demands of the Radiumhemmet made it necessary for Forssell to choose his lieutenants, he did so with discernment and foresight. Elis Gustav Emanuel Berven (1885–1966),^B recently graduated from the medical school of the Karolinska Institute in 1913, was the first associate. He was to devote a professional lifetime of stubborn effort to the Radiumhemmet and made lasting contributions to the radiotherapy of cancer of the upper air passages. His thesis on cancer of the tonsil, a detailed and exhaustive presentation, is a recognized milestone.⁸⁶ James Ernest Heyman (1882–1956),^B a graduate of the University of Uppsala with training in gynecology, became Forssell's associate in 1914. A

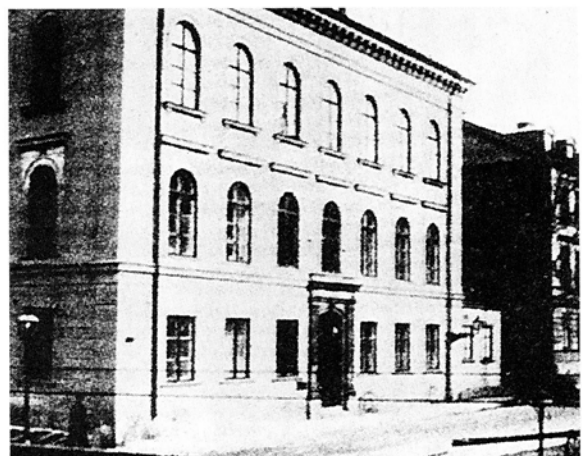


Fig. 5-3. The Radiumhemmet (1916).

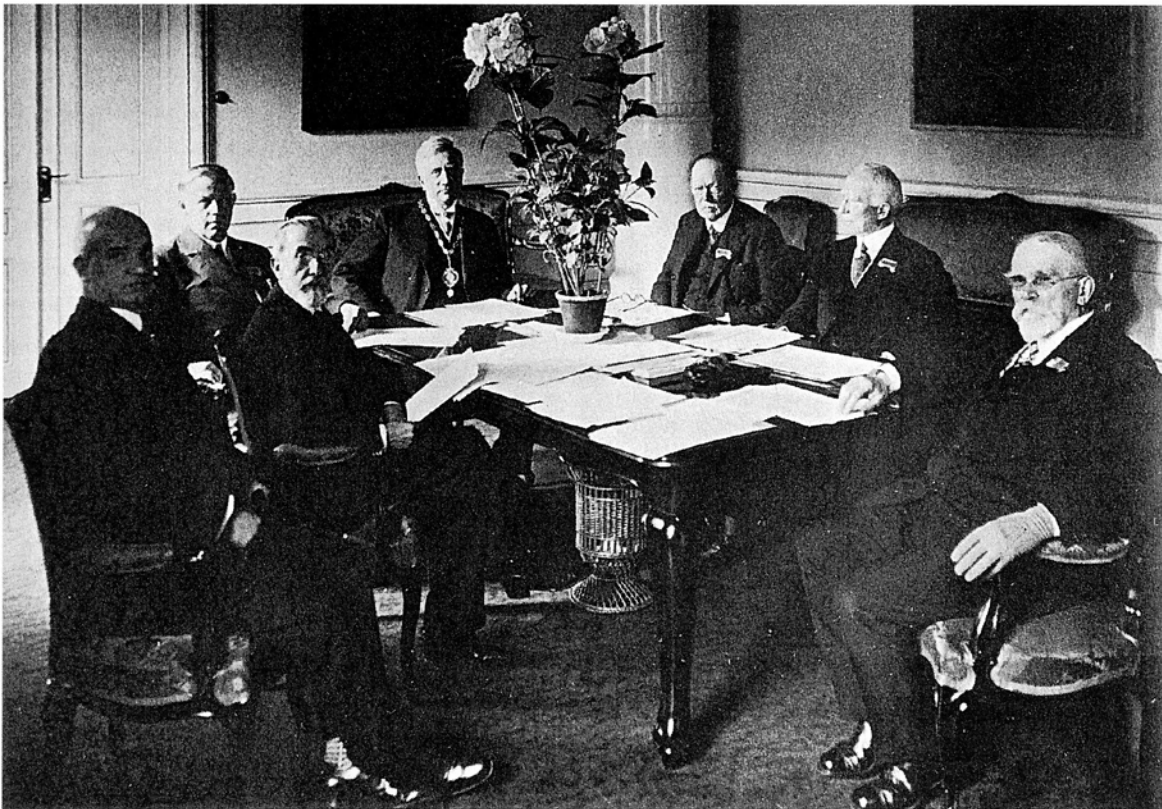


Fig. 5-4. Executive Committee of the International Congress of Radiology, elected in Stockholm in 1928. From right to left (counterclockwise): Antoine Bécélère of France; George Edward Pfahler of the U.S.; Charles Thurstan Holland of England; Forssell with ceremonial badge and collar; Walter Friedrich (1883–1968) of Germany; in front of him, Pasquale Tandoja (1870–1934) of Italy; to the extreme left, Martin Haudek (1880–1931) of Austria. (Courtesy of Mlle. Antoinette Bécélère.)

compassionate physician and a perfectionist, Heyman, was to be identified with the Stockholm method which he refined with the packing technique of intracavitary radiumtherapy for carcinoma of the endometrium, and with the technique of vaginal brachytherapy.^{278,279} It was Forssell who coined this word for short range irradiation as opposed to teletherapy. Heyman and Lacassagne were the principals of a subcommittee of the League of Nations Health Organization that devised the staging of carcinoma of the cervix which has endured to this day. The Annual Reports of the compilations of this committee, edited by Heyman, attest to the statistical and educational value of this exemplary activity.²⁷⁷ Originally collated and reported in Stockholm, the reports were later issued from Geneva and had the sponsorship of an international gynecological organization (FIGO).

In 1916 the Radiumhemmet was moved to 23 Fjallgatan to premises rented from a former commercial concern. Additional roentgentherapy units were added, and the number of beds was doubled. In 1917 Forssell became the first Professor of Medical Radiology at the Karolinska Institutet, the medical school of the University of Stockholm. Within a few years, a

permanent Chair of Radiology, one of the earliest in the world, was established in the Faculty of Medicine of the University of Stockholm. In 1919 Forssell founded the Northern Association of Medical Radiology and also its official publication, *Acta Radiologica*, of which he was the Editor-in-Chief for the rest of his professional lifetime. He also founded an Association for Medical Research to which he as well as others made monetary contributions. The Swedish government granted Forssell a singular request: free transportation to and from the Radiumhemmet for any and all patients for treatment and follow-up. It proved to be a most important and lasting subsidy.

Forssell's extraordinary success on behalf of radiology as a medical specialty brought him into focus on the international scene. In 1924 George Winslow Holmes (1876–1959), president of the American Roentgen Ray Society, invited him to give the annual lecture in honor of Eugene Wilson Caldwell (1870–1918).^B Forssell chose to talk in Swampscott, Massachusetts, on the permanency of radiotherapeutic cures of malignant tumors.²³⁶

Forssell was the invited Swedish delegate to the first International Congress of Radiology, held in



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Fig. 5-5. Gösta Forssell around 1937. (Courtesy of Acta Radiologica.)



Fig. 5-6. Present day Radiumhemmet in the Karolinska complex of Stockholm. (Courtesy of Prof. Jerzy Einhorn.)

London in 1925 under the presidency of Charles Thurstan Holland (1863–1941), Liverpool pioneer of radiology (subj. note 5.3). Among the invited presentations was one on “saturation radiotherapy” by George Edward Pfahler (1874–1957)^B of Philadelphia. A Committee of Units and Measures was established and charged with seeking international agreement on radiation dosimetry. Forssell’s active and enthusiastic participation made him the choice of his colleagues to organize the next congress.

In 1926 the Radiumhemmet was moved to larger quarters, and Forssell became president of the Swedish Cancer Association. The second International Congress of Radiology took place in Stockholm in 1928 with Gösta Forssell as president. The Congress Committee consisted of a group of his hard working collaborators. There was a total of 964 registrants from 40 different countries. The inauguration was held at the Konserthuset in the presence of His Royal Highness, Prince Karl. Holland placed over Forssell’s shoulders a ceremonial collar bearing a badge, the gift of British radiologists. In each of the link medallions, the name of succeeding Congress presidents was to be inscribed. The Congress theme was “Educa-

tion and Training in Medical Radiology,” and Forssell gave the opening lecture. “Radiology has ... acquired a secure position as an independent discipline,” proclaimed Forssell, “it has become clear ... that a thorough instruction and special training in medical radiology are essential”²³⁸ Another of the contributors to this symposium was Preston Manasseh Hickey (1865–1930)^B of Ann Arbor. The Congress sections of radiodiagnosis (85 papers) and radiotherapy (56 papers) met in the Riksdagshuset (House of Parliament). An original feature of the section of radiotherapy was the presentation of 100 patients cured by radiotherapy, including Dr. Stenbeck’s 1899 patient. To accommodate a number of contributions of Mikhail Isaevich Nemenov (1880–1950) and his associates of the Leningrad Institute of Roentgenology and Oncology, a new section of radiobiology was created in which 40 papers were read. Also, 44 papers on physics of radiations were presented. The Committee on Units and Measures reached an agreement and issued a definition of an international unit: the roentgen. Because a Roentgen unit (with capital R) was already in use, the lower case letter was adopted for the new unit. A Commission on Radiologic Protection

was formed. An Executive Committee of the International Congress, to assure continuity of the event, was established (Fig. 5-4).

Forssell played an important role in the third International Congress of Radiology, held in the halls of the Sorbonne in Paris. On Sunday, 26 July 1931, a memorable scene was staged in the Grand Amphitheater. The tall handsome Swede placed the ceremonial collar on the shoulders of the short charismatic Antoine Béclère before a generation of his students. Forssell wore a black cutaway and striped pants; Béclère wore gray gloves to cover the radiation injuries of his hands. In this inaugural ceremony, Pfahler presented a gift from American radiologists to the Congress: an ivory gavel made from the tusk of a fossil mammoth that had been embedded for 250 centuries in northern glaciers. During the Congress, at a special convocation of the American College of Radiology, Marie Sklodowska Curie received a gold medal.⁴⁹² Forssell delivered the inaugural lecture on the subject of "The Social Struggle Against Cancer": "The fundamental condition of effective treatment of cancer patients," said Forssell, "is a well organized medical education of the early diagnosis and treatment of cancer The essential condition of ... an efficacious radiotherapy of cancer," he added, "is the organized teaching of radiotherapy and of cancerology to medical students as well as to physicians"²⁴⁰ An unforgettable dividend for those attending the Congress was the Colonial Exposition being held in Paris that summer. The skyline of the Bois de Vincennes was adorned by the majestic silhouette of a reproduction of the Cambodian Temple of Angkor. The fair was a folklore extravaganza pervaded by the popular Caribbean rhythms of the beguine and the rhumba.

From 1928 to 1937, great progress was made in Sweden, thanks to King Gustav V's Jubilee Fund. By personal decision of the generous monarch, new centers were founded in Gothenborg and Lund that were patterned after the Radiumhemmet. Under royal sponsorship, the Karolinska Sjukhuset was created, incorporating the expanded clinical facilities of the Radiumhemmet. An Institute of Radiopathology, under the able direction of Olle Pettersson Reuterwall (1888–1956),^B was added along with an Institute of Radiophysics, the domain of Rolf Maximilian Sievert (1896–1966).^B

A pioneer who contributed and had interest in both radiodiagnosis and radiotherapy, Forssell was one of the earliest advocates of separation of the practice of these disciplines. In 1936 the generosity of a grateful patient permitted the creation of a chair of Therapeutic Radiology at the Faculty of Medicine of the University of Stockholm. Characteristically, Forssell retained for himself the chair of Radiodiagnosis, and Elis Berven became the Mimi Althainz Professor

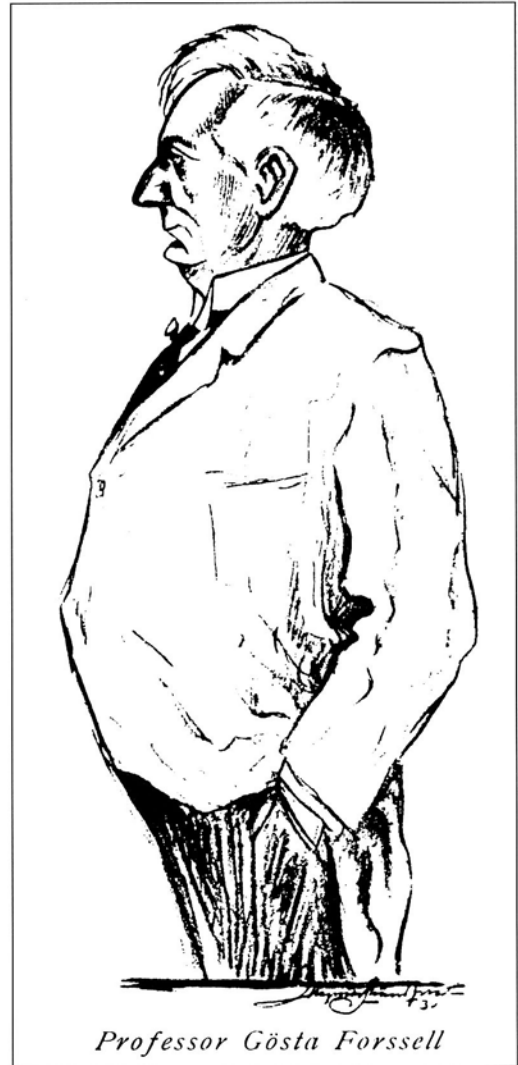


Fig. 5-7. Caricature of Gösta Forssell by Strandqvist.

of Radiotherapy, one of the first professorships in therapeutic radiology in the world.²⁴²

Forssell continued to be an animator in the International Congress of Radiology. His elegant figure was the subject of attention in Zurich (1934) (Fig. 5-5). At Chicago in 1937 an Indian radiologist was seen kneeling before him to receive his blessing. In 1941 he retired and became a consultant to an insurance company. He devoted serious attention and time to the insurance business. His excellent health was eventually impaired by the need for surgical interventions and gave way to circulatory failure. He was unable to attend the anticipated post-war resumption of International Congresses in London (1950). On 13 November 1950 at the Karolinska, he passed away. Few protagonists of radiology have been so widely and genuinely lamented. He received during his life innumerable honors, such as Fellowship in

the Royal Society of Medicine and the gold medal of the Radiological Society of North America, but none that he was as proud of as the signaled honor to have been chosen (1939) to address his king in the name of his nation.⁸⁷ The Radiumhemmet and its continued tasks and achievements shall remain the living tribute to his memory (Fig. 5-6).

Forssell was a most unusual man. An inspired dreamer, he was also a magnificent pragmatist, capable of gaining the friendly cooperation of those with diverse views. A researcher and teacher, he was also a dedicated student.²⁴³ A great animator and organizer, he appeared always grateful for the opportu-

nity to build for others. A happy husband and father of four children, he was venerated by them. A charming person with regal demeanor, beloved and admired, he was also an affable and cordial friend. A man of mature beauty, he gave an impression of strength that could only come from a wholeness and harmony of mind and heart, conferring a natural dignity to his ethical pursuits (Fig. 5-7).

More than any of his contemporaries, Gösta Forssell saw in the practice of clinical radiotherapy the natural nucleus around which cancer research and the multidisciplinary care of cancer patients could be fruitfully organized. The idea is novel still.

Subject Notes

5.1 Stenbeck's patient received 150 irradiations in nine months and was living and well thirty years later.

5.2 Surprisingly, a fifth International Congress of Electrology and Medical Radiology was being held simultaneously (13–18 Sept. 1910) in Barcelona, under the august patronage of the King of Spain. The previous such congresses had been held in Paris (1900), Berne (1902), Milan (1906), and Amsterdam (1908). After Barcelona, there were two other congresses, one in Prague (1912) and another in Lyon (1914). These congresses were then discontinued, and are not related to the present series of International Congresses of Radiology.

5.3 This first International Congress of Radiology, held in London (1925), was followed by Stockholm (1928), Paris (1931), Zurich (1934), and Chicago (1937). After the war, the series was resumed in London (1950), Copenhagen (1953), Mexico City (1956), Munich (1959), Montreal (1962), Rome (1965), Tokyo (1969), Madrid (1973), Rio de Janeiro (1977), Brussels (1981), Hawaii (1985), Paris (1989), Singapore (1993) for radiodiagnosis and Kyoto (1993) for radiotherapy.