

Magnus Strandqvist

(1904–1978)

“The purpose of this study is not to establish definite figures but to present working methods with the help of which future investigations may yield a better understanding of fractionation.” (1944)⁶⁴¹

Magnus Tore Petter Strandqvist was born on 29 December 1904, in Skövde, west of lake Vättern, in Västergötland, Sweden. His mother, Anna Stenlund (1876–1966), in 1901 married the widower Johan Leonard Strandqvist (1860–1938). Strandqvist had three sons by a previous marriage: Erik (1891–1984), Anders (1892–1917), and Birger (1897–1988). Magnus had an older brother Henrik (1902–) and a younger sister, Elsa (1907–1938) (Fig. 17-1). On his mother’s side, Magnus was the grandson of Sofia (1838–), who in 1860 married Carl Reynold Stenlund (1838–), an itinerant clothes salesman and farmer. They had five sons and two daughters besides Anna. On his father’s side, he was the grandson of Anna Hansdotter (1830–1909), who married Erik Andersson (1827–1866), a poor farmer who died at age thirty-nine, leaving his widow to support their daughter and three sons. In 1886, the three Erikson brothers adopted the family name of Strandqvist.

Magnus received his elementary and secondary schooling in Skövde, graduating from its local gymnasium in 1923. He favored mathematics, physics, and drawing, and built a chemistry laboratory at home (Fig. 17-2). Leonard Strandqvist, Magnus’s father, had risen from poverty to become a successful businessman, an importer of wines and gourmet foods (Fig. 17-3). He was a generous patriarch, who transferred his passion for sailing to his children. He and his wife sought for their children the formal education they had missed. Anna Strandqvist gave her family their love of music. Birger was the most accomplished pianist, but Magnus and Elsa played enjoyable four-hand piano pieces.

Following graduation from Gymnasium, Magnus wished to study art but encountered parental objections. He registered at the Tekniska Högskola of

Stockholm, intending to study architecture, but was soon dissatisfied with this choice. Birger, the youngest and closest to him of his half-brothers, was a senior medical student. He suggested the study of medicine to Magnus. Thus, Magnus enrolled at the Karolinska Institutet to begin his medical career at the University of Stockholm. He had no previous contact with medicine. There was a family story that, as a child, he had attempted an appendectomy on his sister’s doll, but made the incision on the wrong side. Under the influence of their religious mother, his brother Henrik became a preacher and, in time, a deacon of the Lutheran church.

As an undergraduate, Magnus was introduced to the practice of surgery under Professor Abraham Trolle (1891–1954) at the Serafimer Lasarett. He also worked under Professor Herbert Olivecrona (1891–1980), for whom he made anatomical drawings later used in the professor’s textbook on brain surgery. He also worked under Gösta Forssell, chairman of the department of medical radiology, who gave him his interest in oncology. Forssell, founder and first director of the Radiumhemmet, was also president of the Svenska Cancerföreningen and had dedicated his life to the organization of the fight against cancer in Sweden.^{244,496}

Strandqvist’s artistic talents were put to ample use by his classmates in the organization and decoration of the students’ annual ball. He was also responsible for a great deal of the humor displayed on such occasions. In 1931, Strandqvist received his medical bachelor degree from the University of Stockholm. That same year, he published a book entitled *Aesculapii Söner*, a remarkable collection of caricatures of his professors (Fig. 17-4).⁶³⁵ Among them, under the caption of “Rounds,” he depicted Professors Johan

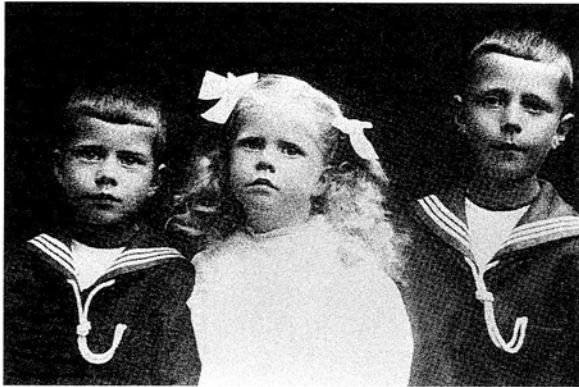


Fig. 17-1. Magnus, Elsa, and Henrik Strandqvist in 1914. (Courtesy of Ulla Silfverhielm.)

Christia Jacobeus (1879–1937), Stig Bjorkman (1901–1982) and Nord, walking to visit their hospitalized patients, preceded as tradition dictated by the chief resident, here objectively displaying his inflated pride (Fig. 17-5). The success of this volume led to the publication of a second one (Fig. 17-6).

In 1932, Strandqvist entered the Radiumhemmet. From its humble beginnings in 1910, in a rented eight-room apartment at Scheelegatan 10, with only six beds and a precious horde of 120 milligrams of radium, the Radiumhemmet had flourished in the 1920s. Under the aegis of the Svenska Cancerföreningen, with private bequests, a grant from the Stockholm City Council, and a gift from Her Majesty Queen Victoria, the institution moved in 1926 to larger quarters at Fjalgatan 23, where thirty-four beds and three roentgentherapy units were accommodated. Physics and research laboratories were soon added. Elis Berven,^B Forssell's first assistant, succeeded him as director of the institution.²⁴⁴

Strandqvist served two years as a trainee under Berven, who treated primarily patients with cancer of the upper air passages and skin. He also served an apprenticeship under James Ernest Heyman (1892–1956),^B who introduced him to brachytherapy techniques of gynecological intracavitary curietherapy. Under both these mentors, Strandqvist learned the practice of roentgentherapy, then limited to two hundred kilovolts. In 1934, Strandqvist was appointed an assistant at the Radiumhemmet.

The widow Märta Haglund Skogberg (1884–1935) was a patient of Professor Jacobeus. Her daughter, Irma, visited her at the University Hospital where she met young doctor Strandqvist. Magnus and Irma shared a great interest in the arts. They enjoyed each other's company, fell in love, and were married. In 1936, Irma had their first child, Marieann.

The Health Organization of the League of Nations had a Commission on Cancer, with a Committee on Radiology composed of James Heyman (chairman) of Stockholm, Antoine Lacassagne of Paris, and A. B. Smallman of London. They proposed the first clinical staging of patients with cancer in 1929. Their classification of cancer of the cervix in four stages was widely adopted but variously interpreted. After a few years of trials, with the help of J. Ducuing of Toulouse, L. Adler of Vienna, and William Healy of New York, the committee adopted Stage 0 and simplified its definitions. It was agreed that a more uniform allocation would be obtained by graphic demonstration of the stages. Dr. Heyman was charged with publishing an atlas. Strandqvist assisted him and drew the diagrams accompanying the definitions of stages. These have remained in use for decades.^{27b}

In 1936, the generosity of a grateful patient permitted the creation of a chair of radiotherapy at the Karolinska. Forssell kept for himself the chair of radiodiagnosis, and Berven became the Mimmi Alheinz Professor of Therapeutic Radiology of the University of Stockholm, one of the earliest such positions in the world.²⁴⁴

Its works had brought the Radiumhemmet justifiable fame. The generosity of King Gustav's Jubilee Fund finally gave it much-needed space and equip-

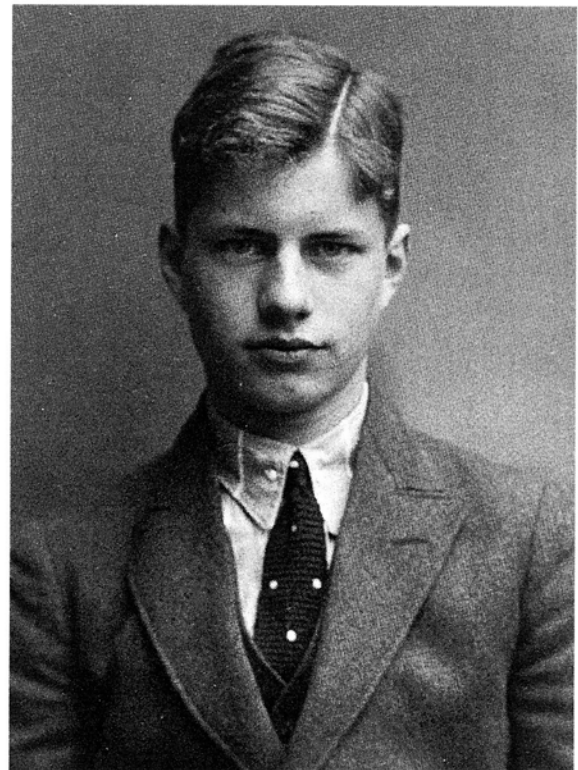


Fig. 17-2. Magnus Strandqvist, 1918.

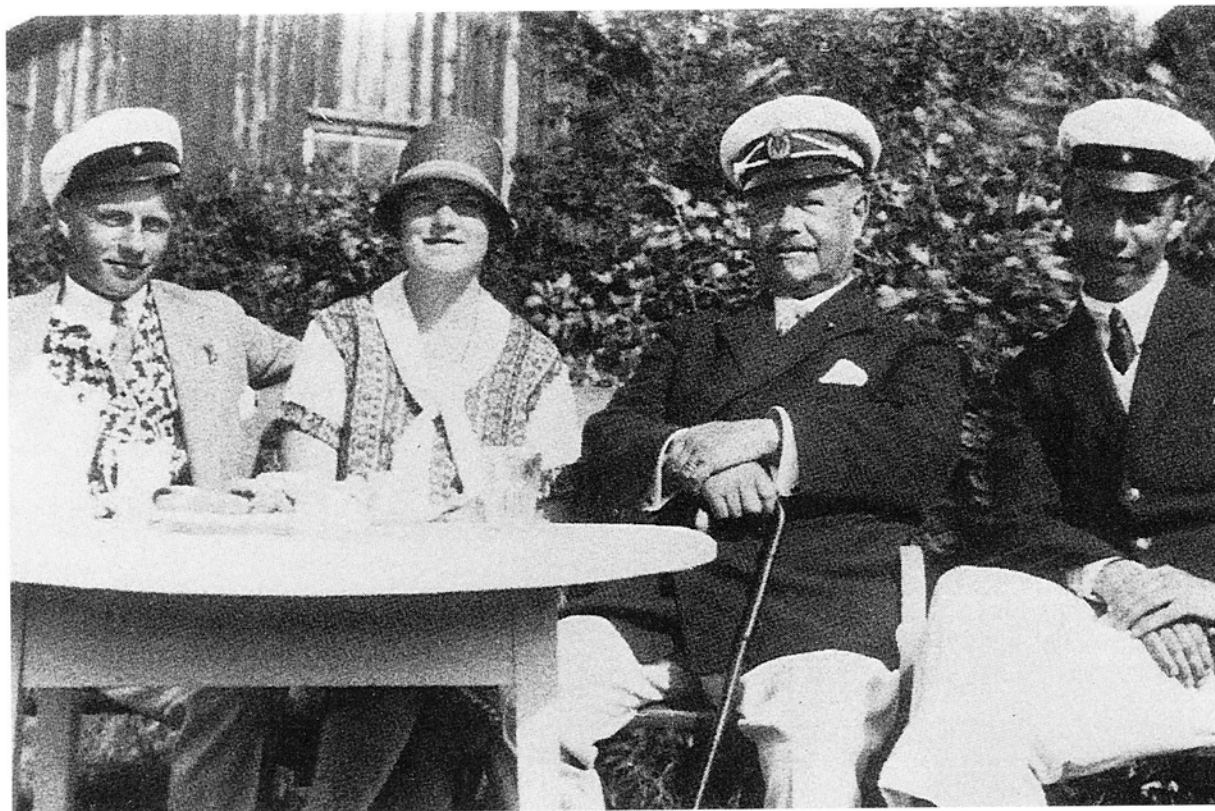


Fig. 17-3. Elsa and Leonard Strandqvist with their sons, Magnus (left) and Henrik, in 1923.

ment as it moved again to be incorporated in the Jubilee's Clinics of the Karolinska in 1937.²⁴⁴ Thus, it was better able to treat an increasing number of patients coming from all parts of Sweden. Strandqvist was active in the organization of adequate follow-up of patients and in developing the necessary statistical systems. The departments of pathology and physics were transformed into the Institute of Radiopathology under Olle Reuterwall^B and the Institute of Radiophysics under Rolf Sievert.^B Gustav Thoreaus^B had been an assistant to Sievert since 1927. These institutions worked in close collaboration with the other medical departments of the University Hospital.

Strandqvist's beloved sister, Elsa, a high school teacher, suffered from Hodgkin's disease and received repeated series of irradiations at the Radiumhemmet. She died there in 1938. Their elderly father also died in 1938.

As an assistant in radiotherapy, Strandqvist had first dedicated his inventive mind to the development of devices or technical procedures. He wrote a paper on a direction indicator for X-ray tubes, and another on a circular slide rule for calculating time of irradiation.^{636,637} He also wrote papers on a dosage system for surface radium applications.^{638,639}

Hugo Ahlbom (1900–1952)^B was the deputy director of the Radiumhemmet and a keen researcher in radiotherapy. He wrote a transcendental monograph on salivary gland tumors.⁶ In it he revealed the connection between the high incidence of cancer of the oral cavity, pharynx, and esophagus in underprivileged Swedish women and the Plummer-Vinson syndrome. The treatment of cancer of the esophagus was left, for the most part, to radiotherapists. The most frequent approach was the introduction of bougies, loaded with radium capsules, into the lumen of the esophagus. Intraluminal brachytherapy most often failed because of its inability to reach in sufficient strength the mediastinal lymph node metastases. Strandqvist became interested in attempting to irradiate both the primary and metastatic manifestations by external roentgentherapy. He planned a technique of irradiation through three anterior and three posterior fields, all directed to the esophagus. In this fashion, he intended to compensate for the weak penetration of two hundred kilovolt radiations. He treated thirty-six patients, resulting in considerable palliation but few cures.⁶⁴⁰

It was during the tumultuous decade of the 1930s, when pages of joy and sorrow were added to the book of his life, that Strandqvist conceived and began his work on the equivalent relationships of

doses in various fractionations, an analytical study for which he became known. A biological unit of the effects of radiations had long been sought by many. The exposure capable of producing a visible erythematous reaction of the skin, the erythema dose, was variously established. Some workers used a threshold erythema, while others used a frank dark erythema.^{475,532} Discrepancies in the quality of radiations used by various workers and unsatisfactory physical measurements of dose hampered the possibilities of comparisons.

Some X-ray generators delivered radiations continuously, others in fifty or a hundred pulsations per minute. If this resulted in any biologic difference, it was smaller than the possible experimental error. Variations in output were also reported to bring about different effects, depending on whether individual fractions were delivered in short or protracted exposures. McWhirter found that a twelve-fold variation in the intensity of delivery of roentgen rays made no difference in the effects.⁴³⁰ Working with



Fig. 17-4. Front cover of Strandqvist's book of caricatures.⁶³⁵

ROND!

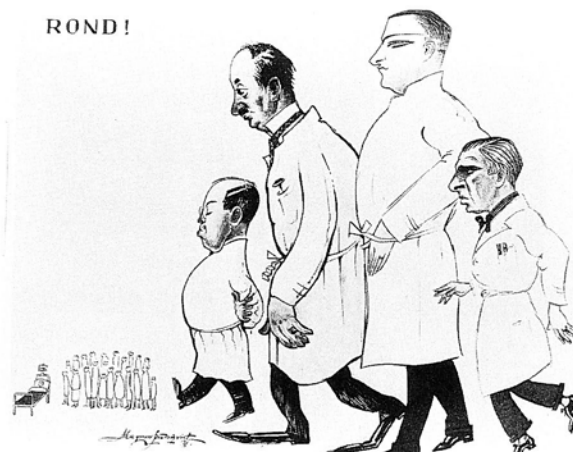


Fig. 17-5. "Rounds": Professors of Medicine preceded by chief resident Gustav Nylin.⁶³⁵

gamma rays, he found no difference in the effects whether the dose was administered continuously or with interruptions.

Regaud and Ferroux had shown that a smaller total dose administered in fractions was more effective than a larger one delivered at one sitting.⁵²¹ Coutard had obtained early results in radiotherapy of cancer of the pharynx and larynx by fractionation of the total dose over several weeks.¹¹⁴ However, radiotherapists were uncertain as to the equivalent dose administered in different numbers of days.

Observers of radiophysiologic effects had become concerned with the "loss of effect," the rate of recovery following a single exposure. Kingery assumed that half the effect wore off in 3.5 days and half of the remainder in another such period.³⁵⁵ His saturation method consisted of the administration of an initial dose, followed four days later by 50% of the same dose, 40% additional dose eight days later, and so on in exponential progression. Karl Stenström^B irradiated adjacent areas of human skin using an erythema dose delivered at one sitting, and found that it was possible to administer 120% of the same dose if delivered in four equal daily fractions, 130% if fractionated in eight days, 140% in ten days, and 150% in sixteen days. He concluded that if the law of mass reaction (adapted from chemistry) was assumed to hold for these effects, the curve corresponding to such experimental values could be expressed by a mathematical equation: $I = I_0 X e^{0.0833t}$ in which e is a constant equal to 2.718 (subj. note 17.2).

Hoffman and Reinhard, who followed Stenström at the Roswell Park Memorial Institute of Buffalo, New York, continued to assume that the rate of recovery was exponential. The effective cumulative dose tended to an equilibrium when the rates of effectiveness and recovery became equal. Without consider-

ation of anatomy, histopathology, or any other factors, they proposed a series of equations for the treatment of various forms of cancer. Reinhard and Goltz attempted to determine the relationship of total to cumulative dose using common increments and by calculating the residual effect on the basis of Stenström's equation.⁵³¹

Basing his observations on the erythema dose of the skin, Reisner found that twelve daily fractions of 20% of the erythema dose, or four fractions of 60% of it, delivered on the first, third, seventh, and tenth days, produced identical results to those of a single application of 100% of the erythema dose.⁵³² Reisner estimated the loss of effectiveness of the first irradiation to be on the order of 35%. The time factor continued to challenge the imagination of researchers. Liechti found a relationship of the radiation effect to that expressed in the Schwartzchild's law of photobiology, which takes into consideration the intensity of exposure.⁴²¹

Working at the Memorial Hospital of New York, Quimby and McComb observed that the reaction caused by a single irradiation of the skin with 825 *r* was identical to that produced by five daily exposures of 300 *r*.⁴⁷⁵ They estimated the recovery from a first irradiation to be on the order of 31%, but that the recovery from subsequent irradiations was smaller and less rapid. They concluded that any assumption of constant recovery was unwarranted and that a "saturation method" could not be justified on that basis. Most physical researchers seemed to have overlooked the basic radiophysiology of skin reactions, their histological substratum.

Strandqvist made a thorough review of the medical literature on the subject of fractionation. He was conversant with the various points of view, particularly those of Quimby and Reisner. He concluded that the significance of fractionation was not well understood. He also thought that the results of radiotherapy of cancer in a series of patients using different fractionations could also be used as a test that would provide useful information. Making detailed notations of size, location, and histopathology, Strandqvist carried out a study of 183 cases of basal cell carcinoma of the skin, 74 squamous-cell carcinomas of the skin, and 23 of the lower lip, irradiated at the Radiumhemmet from 1934 to 1941. Some of these patients had received a single massive dose and others a daily irradiation over periods extending to six weeks. Doses had been measured carefully with Sievert's condenser chamber and expressed in *roentgens* delivered plus calculated back scatter.

In the clinical practice of radiotherapy of cancer, it was widely recognized that the larger the dose, the greater the chance of cure. It had also been shown that there were advantages to fractionation of the to-

tal dose. The problem was to find the optimal total time in which to deliver the planned dose. Plotting in graphic coordinates the total doses received by his patients against the total number of days in which they were administered, Strandqvist observed that successful cases followed a curve (a parabola) above which most of the necrotic effects and below which most of the recurrences were found. He resisted the apparent conclusion and raised his own objections to a mathematical treatment of biologic data of a law covering radiobiologic effects. Nevertheless, he felt that the cumulative effects of variously fractionated total doses could be computed according to a law resembling Schwartzchild's law of photobiology which is expressed in a parabola. When the facts of the parabola were plotted in a double logarithmic graph, as suggested by Witte, the parabola became a straight



Fig. 17-6. Caricature of Professor Berven by Strandqvist. (Courtesy of Mrs. Irma Strandqvist.)

line, responding to the equation: $D/d = (T/t)0.22$, according to which a single dose of 2250 r delivered at one sitting, a total dose of 4200 r delivered in six days, or 6000 r fractionated in thirty days were equivalent.^{677,641}

The slope 0.22 of Strandqvist's curve was in accordance with previous observations by Quimby and Reisner. Moreover, he chose the ninety-five most comparable cases of basal cell carcinoma and calculated their position on the slope based on the least square method of curve fitting. The results were the same. He also came to the conclusion that within certain limits, the effects depended only on total dose and overall time, independent of the size of fractions or the intervals between them.

A similar study of the results of radiotherapy of deeply seated tumors would have to reckon with additional contingencies: that a dose calculated at a given point of the anatomy is not an expression of dose received at any point of the tumor, that tumor response is influenced by the structures it may involve, that the outcome may be governed by the development of metastases, etc. However Strandqvist reported that he had applied his formula to the published details of radiotherapy of malignant tumors by

Coutard, Zuppinger, Frank, and Wachsman and found correlation with his curve.^{174,705,246,648}

Strandqvist also undertook studying doses of radiations capable of producing the progressive radiobiologic effects of irradiation of normal skin: erythema, dry epidermitis (sicca), moist epidermitis (exudativa), and dermatitis (necrosis). He found that the doses capable of producing these reactions could also be plotted in a straight line on a double logarithmic graph (Fig. 17-7).

Critics of Strandqvist's work have pointed out that tumors in his study varied greatly in size, that treatments were administered with radiations of different quality, that several different filters were used, that few patients were treated in more than sixteen days, and that the fourteen necroses and fifteen recurrences were too few to be considered statistically. Strandqvist himself recognized many of these shortcomings. It has also been pointed out that the dose chosen to start a slope does influence its shape. Nevertheless, Strandqvist's thesis had an impact rarely equaled in the annals of radiobiology and, as intended, provided a basis for future research. It is considered as one of the outstanding works of the Radiumhemmet.

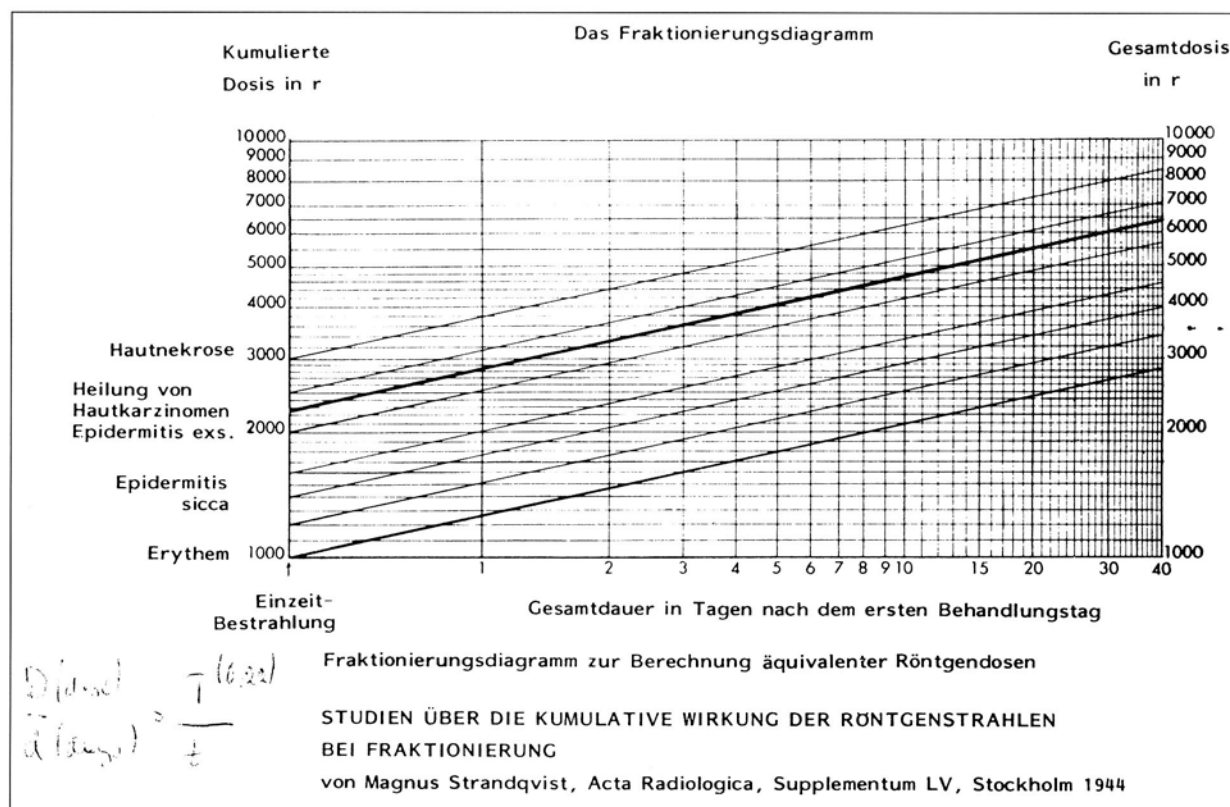
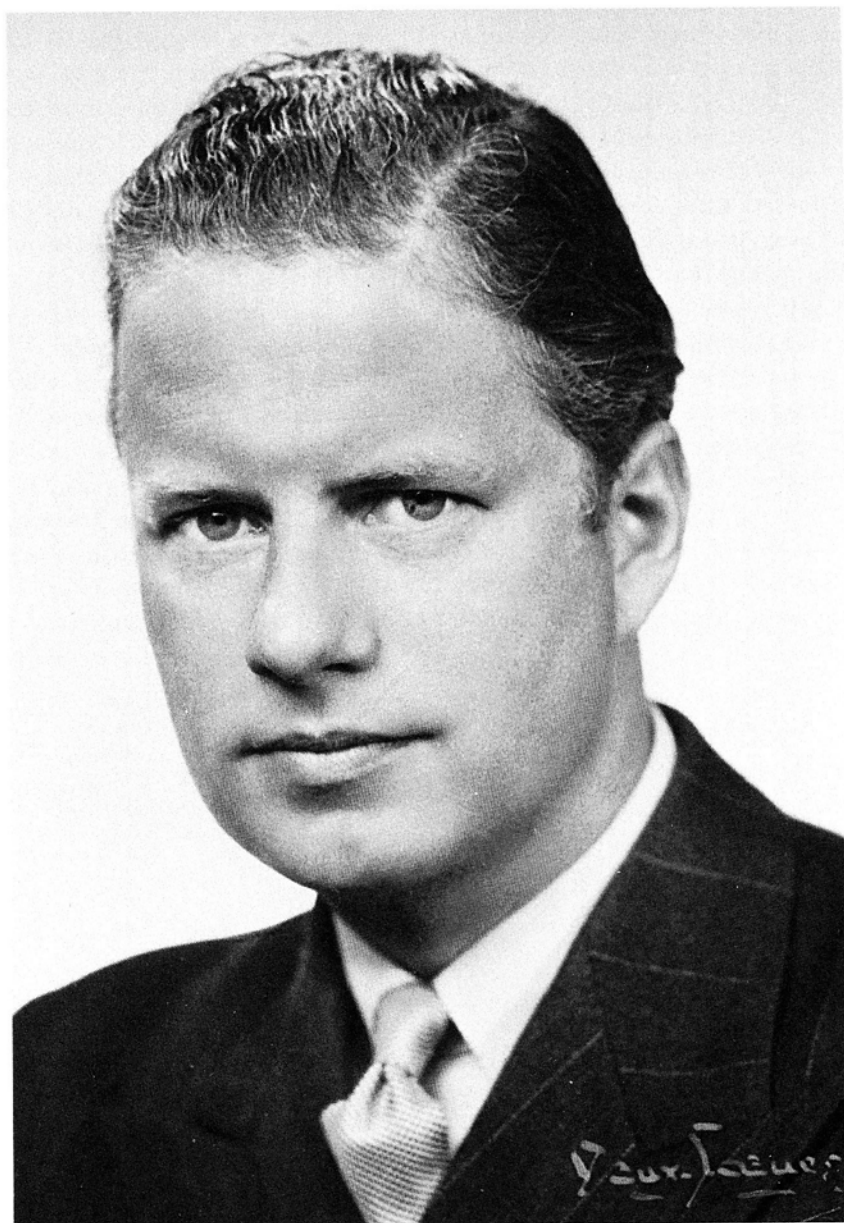


Fig. 17-7. Double logarithm graphic. From Strandqvist's thesis.⁶³⁵



Magnus Strandqvist

Fig. 17-8. Magnus Strandqvist, Professor of Radiotherapy and Director of the Konung Gustav's Jubilee Clinic. (Courtesy of Mrs. Irma Strandqvist.)

In the years following World War II, the subject of time-dose relationships was variously approached by researchers. DuSault, irradiating tumors in lower animals, concluded that longer fractionation required larger total doses.¹⁷⁰ She pointed out that type was a factor of importance in determining time-dose relationships, and that a statement of dose should always include overall time and degree of fractionation. El-kind and Sutton, working with cultured cells *in vitro*, observed slow recovery and offered a different view of the way in which the effective total dose accumulates in time.¹⁷³ Fowler and Stern, using the skin of pigs as a test, pondered whether tissue recovery or less effective fractions caused the need for larger doses.²⁴⁵ They showed that the overall time was relatively unimportant between five and twenty-eight days and that fewer and larger fractions required a reduction of the total dose. Ellis suggested a formula relating total dose, number of fractions, and overall treatment time to a quantity termed Nominal Standard Dose (NSD), for comparing treatments with different fractionation and overall times.^{174,644} Dutreix and others found that recovery and repopulation depend on the size of fractions.¹⁷¹

During World War II, Strandqvist served in 1940 and 1941 in the Swedish armed forces as a radiologist in an Army hospital on the island of Gottland.

In Göteborg, the practice of radiotherapy had developed at the Sahlgrenska Sjukhuset under Dr. Fredrik von Bergen (1877–1951). Private donations and a grant from the city council had permitted the purchase of over two hundred milligrams of radium and, as early as 1921, the services of radiodiagnosis and radiotherapy had been separated. Under von Bergen, plans gradually developed to provide the second largest Swedish city with worthy medical facilities for the treatment of cancer. King Gustav's Jubilee Fund provided for the building and equipment of an adequate cancer center.

In 1942, Strandqvist was called to Göteborg to take charge of radiotherapy and to survey plans and construction of the new facilities. He spoke the language of the architects and engineers and easily won their cooperation. The Konung Jubilee Clinic of Göteborg was inaugurated in 1943, and Strandqvist was appointed its director (Fig. 17-8). Organized in the fashion of the Radiumhemmet, the center had all of the necessary ancillary services. The chief radio-



Fig. 17-9. The Konung Gustav's Jubilee Clinic of Göteborg.

pathologist was Hild Hansson (1899–1967) and the chief radiophysicist was Sven Benner (1900–1986).

Strandqvist gave himself wholeheartedly to the development of the institution and the organization of its works. He gave untiring attention to his patients and to the conduct of their treatment. The medical records of the center testify to the careful compilation of details, often with his drawings of lesions. He was also attentive to the call of his medical colleagues for frequent consultation. Alert to new developments, Strandqvist was prompt to try them.

Jens Nielsen (1900–1964), director of the Radiumstation of Copenhagen, initiated a trial of “rotation” radiotherapy for the treatment of cancer of the esophagus. It was an extension of Strandqvist’s efforts to compensate for the weak penetration of two hundred kilovolt radiations, distributing the surface dose over the entire chest surface while rotating the patient. The procedure required special arrangement of equipment and fluoroscopic monitoring. All of this was adopted by Strandqvist with the help of New Yorker Henry Wallman (1915–) of the Chalmers Tekniska Högskola of Göteborg.

Hugo Ahlbom, Berven’s successor as director of the Radiumhemmet in 1950, died prematurely in 1952. Berven made considerable efforts to have Strandqvist assume the directorship, but other forces prevailed to keep him in Göteborg.

In 1953, after a decade of work in his adopted city, Strandqvist was appointed professor of radiotherapy of the School of Medicine of Göteborg. That same year, he went to Copenhagen as a member of the official Swedish delegation and as special representative of the Swedish Royal Academy of Science to the seventh International Congress of Radiology.

During the International Congress, Jens Nielsen, who was its vice-president for radiotherapy, invited all registered therapeutic radiologists to be his guests at a luncheon in the Radiumstation. On that occasion, Nielsen presented the attendees with a proposal to found an International Club of Radiotherapists. Each of the delegates present, representing distant countries, rose to give an opinion or assent. Strandqvist, a man of short physical stature, offered a typical note of humor: “I would stand up to address you,” he said, “but you would not notice the difference.” At the end of the proceedings, he was elected a member of the steering committee in charge of amalgamating the various views and presenting a final founders’ agreement. Two days later, on 23 July 1953, at the Domus Medica of Copenhagen, the International Club of Radiotherapists was formally initiated, and the first members from various countries were approved by those present.

After World War II, Strandqvist promptly adopted the use of radioisotopes and added accelera-



Fig. 17-10. Strandqvist on his sailboat *Irma*. (Courtesy of Ulla Silfverheim.)

tors to his institution’s equipment. The number of patients seeking treatment at the Jubilee Clinic increased steadily (Fig. 17-9). They came from five southwestern counties: Halland, Bohuslan, Värmland, Dasland, and Västergötland. Consultations with outside physicians and correspondence demanded considerable time. Residents in training required much time and attention before they could be useful. Most of Strandqvist’s trainees were general radiologists who did not retain or pursue an interest in radiotherapy. Among those who did were: Dag Turesson (1911–), head of the department of radiotherapy at Linköping; Torsten Norin (1923–), Chief of Oncology at Gävle; Sture Lindberg (1925–), radiotherapist at Malmö and later professor of Nuclear Medicine at Göteborg; and Bengt Rosengren (1927–), Professor and Chairman of the Department of Therapeutic Oncology and Radiophysics at the University of Bergen, Norway.

In Göteborg, the Strandqvist family had been augmented by the birth of Ulla (1945–) and a son, Bo (1948–). At home, Magnus relaxed and gave himself to his family. He helped Bo with his electric train and built a marionette theater which he operated to the amusement of all. He also spent long hours at the piano playing Bach, Beethoven, and Handel as well as Schumann, Chopin, and Mozart, while his children tried to guess whose piece he was playing.

As a child, Magnus’s father had taken him to the island of Marstrand. The Strandqvist family spent summers on the island. His brothers, Birger and Henrik, and their families also went there. Once a fortress that had been under the flags of Norway and Denmark, the rocky island later became a prison and a center for herring fishing. The herrings’ capricious visitations ruined the fishing, and Marstrand became

a tourist resort accessible by ferryboat and attractive to yachtsmen.

On holidays, Strandqvist spent considerable time on his sailboat *Irma* (Fig. 17-10). He was a master sailor with an innate understanding of wind and sea. He was as familiar with hulls and sails as he was with transformers and accelerators, as familiar with compasses as he was with ionometers, and as familiar with knots and fathoms as he was with roentgens and isodose charts. Rigging, spars, clews, and gaffs were all part of his vocabulary. He enjoyed taking his family to explore the many islands of the archipelago north of Marstrand. At times he liked to sail alone, savoring the captive force of the wind and the illusion of powerful independence. He was always alert to the unpredictable gales of the Kattegat. Occasionally, on calm seas with the silhouette of the home island on the horizon, a silence broken only by the gentle waves on his ship's bow and the squawking of the seagulls, he would keep to the rhumb line with his eyes on the jib, alert to the leech and luff of the main sail, bringing *Irma* slowly to her mooring.

Strandqvist's feelings for the artistic expression of beauty led him to try an occasional painting, and he took fantastic photographs of giant waves breaking on the rocks. In 1962, Strandqvist's eldest daughter, Marieann was married. Shortly afterwards, she underwent an operation for an acoustic neuroma. She recovered and in 1963 gave him his first grandchild.

Magnus Strandqvist was a kind, generous, and compassionate physician. He was also a gregarious, witty, and charismatic man. At the sumptuous dinners he and Irma offered to their friends in Göte-

berg or Marstrand, he displayed his gastronomic interests and amused his guests with extemporaneous speeches in rhyme and homespun poetry. Everyone thought him divinely gifted. In 1964, when sixty years of age, he experienced the first symptoms of Parkinson's disease. His perfect manners and sense of aesthetics would not allow him to be seen impaired by the ailment, and he withdrew from friends and colleagues, many of whom were not to see him again. At first, he accepted family invitations to be a passenger, but soon he refused to be even a passive sailor.

Looking at the small number of his publications, Strandqvist's apologists have stated he was too busy with the care of patients and had no time to be chained to the writing desk. A different explanation might do him more justice. First, he had no need to write inconsequential papers to make himself known, for his thesis had brought his name to the lips of radiobiologists and therapeutic radiologists all over of the world. Second, although not for publication, he wrote his abundant daily observations in the charts of his patients. Above all, however, as an artist with his own perception of reality, whether in the hospital wards, at the helm of his boat, or at the clavier of his piano, he drew his satisfaction from the performance rather than from its recognition.

Suffering from an implacable disease and expecting little help from medicine, he received instead the attention and love of his family. After fourteen years in seclusion, on 19 March 1978, Magnus Strandqvist, aged seventy-four, was finally relieved of his burden.⁴⁴⁵