Chapter 18

Sir Brian Windeyer

(1904–)

"I do not think that great improvements will come from further developments in apparatus ... (or) from further knowledge of dose distribution and dose measurement ... but ... from the application of more fundamental knowledge of the action of radiations on cells, tissues and organs." (1968)[591]

Brian Wellingham Windeyer was born in Turramurra, near Sydney, Australia, on 7 February 1904. He was the youngest of seven children of Mabel Fuller Robinson (1864–1956), an orphaned Londoner who sailed to Australia at eighteen. In 1891 she married Richard Windeyer, K.C. (1864–1957), a Sydney barrister. On his mother's side, Brian was the grandson of George Hillgrove Robinson. His paternal grandfather was Sir William Charles Windeyer (1834–1896), the eminent Australian legislator and judge who in 1857 married Mary Elizabeth Bolton (1837–1913), daughter of the Reverend R. T. Bolton, vicar of Padbury, Buckinghamshire. Brian had six siblings: Marian Fuller (1893–1983), Lois Elwood (1895–1975), Charles (1897–1917), Richard Michael (1898–1984), Humphrey Camfield (1899–), and Guy (1900–1984) (Fig. 18-1).

Brian's earliest known English ancestor was Walter Windeyer, a direct descendant of the Windeyers of Berne, Switzerland. Walter's son, Charles Windeyer (1780–1855), born in Staffordshire, became the first recognized reporter of the House of Lords. In 1828 he went to New South Wales, and is there remembered as a widely esteemed police magistrate of Sydney. Charles married Ana Mary Rudd (–1864), and had an only son, Richard Windeyer (1806–1847), born in London and educated in France. Following the example of his father, he emigrated in 1835 to become an earnest Australian colonist and reformer. Richard married Marion Camfield (–1878) of Kent. They had only one son, who became Sir William, Brian's grandfather.

On the North Shore of Sydney young Brian attended the Church of England Grammar School (known as "shore"). He studied Latin, Greek, ancient history, and mathematics. There he acquired the knowledge of French that was to prove so important later. He was a good student who also enjoyed competitive sports. His holidays were spent in Tomago, the lovingly kept old family home, preserved as a dairy farm in the bush country, near Newcastle, north of Sydney.

In 1914 Brian's brother Guy was to enter Dartmouth Naval College in England. His mother and sister Lois accompanied him. While they were at sea, the first World War broke out. Mrs. Windeyer and her daughter were not to return home for the duration of the war. They both served in hospitals and ambulances in France. Brian's eldest brother Charles enlisted and was killed in action on French soil.

Brian's education was oriented toward the law, as his father and other members of the family were lawyers. However, on Mrs. Windeyer's return to Australia, and perhaps because of her wartime experience, she suggested medicine. In 1922, although he had not studied physics or chemistry, Brian was admitted to the Saint Andrew's College of the University of Sydney on the strength of the good results shown on his "Leaving Certificate." As an undergraduate, Brian was an athlete of distinction. He played rugby in the South Wales XV (Fig. 18-2), and was one of the players chosen for the Australia-New Zealand combined rugby team in 1923. He was also an oarsman on the crew of his college's cup-winning eight (Fig. 18-3). In 1927 he received his Bachelor of Science and Medical Bachelor degrees from the University of Sydney. He then became a house surgeon in the Prince Albert Hospital of Sydney. The hospital was developing a new department concerned with the uses of radium, and he was assigned to it as a junior registrar (Fig. 18-4).

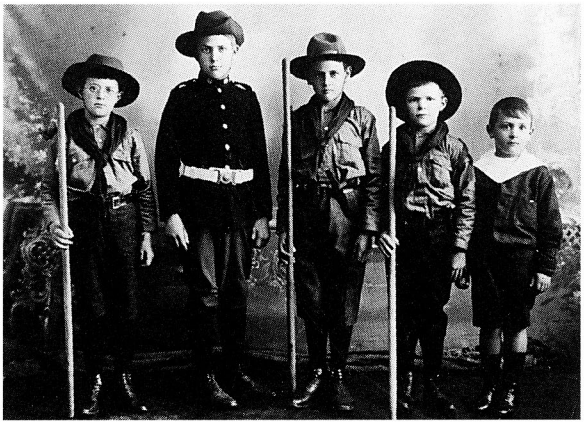

Fig. 18-1. Young aussie Windeyers in 1909: Humphrey Camfield (1899–), Charles (1897–1917), Richard Michael (1898–1984), Guy (1900–1984), and Brian.

On 21 March 1928, Dr. Brian Windeyer espoused Joyce Ziele Russell (1903–1981) at Darling Point in Sydney. The newlyweds planned a trip to Europe. Because of his recent acquaintance with the uses of radioactivity, a surgeon friend suggested that Windeyer should visit the Radium Institute in Paris. In France, Windeyer's knowledge of the language, kept fluent by practice with his mother and sister, proved to be of considerable advantage. At the Radium Institute of the University of Paris, he was met by Professor Regaud and by his deputy, Lacassagne. They were favorably impressed by the young Australian who could speak French. He was offered and accepted a training position as *stagier* of the Fondation Curie.

As he later wrote, Windeyer fell under the spell of remarkable workers at the Radium Institute whose examples and ways of thinking inspired him and had a lasting influence on his professional career.[592] He was moved by "... men and women of so different temperaments and talents ... imbued with a single and selfless motive, the study and the use of ionizing radiation for the benefit of cancer patients." He was impressed by Regaud's scientific outlook and by the lucidity of his exposition, his integrity, and his quiet dignity. Vivacious Lacassagne possessed a rich intellect and stimulated others with his quick grasp of problems and his scintillating wit. Reserved, hard-working, and meticulous, Coutard had no time for dilettantes but willingly discussed and debated his problems and views with younger men. Octave Monod (1870–1934)[B] was a kind, patient, and very skillful clinician. He and Mlle. Juliette Baud (1893–1979)[B] did most of the radium applications with remarkable skill and success.

Jean-Louis Roux-Berger (1880–1957) was the dynamic oncologic surgeon. René Ferroux (1892–1954)[B] was the resourceful physicist who designed one of the earliest telecurietherapy units, and young Georges Gricouroff[B] was the affable and dedicated histologist. The institution, for whose workers Brian used all of the above adjectives, introduced him to a truly multidisciplinary approach, from the treatment of cancer patients to the keeping of meticulous clinical records with persistent follow-up observations. Even the records themselves were an education.

A great number of visitors from various countries went to the Radium Institute, then the mecca of radiotherapy.[696] Innumerable aspirants crossed the channel and visited the Foundation Curie. Many other English-speaking visitors came from Canada, the United States, and other countries. When Regaud addressed a group of English-speaking visitors, Windeyer would often serve as his impromptu interpreter. In the first decade of the century, interest in radiotherapy developed slowly as knowledge of the uses of radium grew and as radium became available. In 1909 a gift of a large amount of radium was made by a Canadian-American industrialist to the Guy's Hospital of London.[498] In addition, there was the endowment of a student scholarship in "actinotherapy" under Dr. C. F. Iridale (written personal communication from S. Golding, Registrar, Guy's Hospital, 1971). Roentgentherapy remained primarily in the

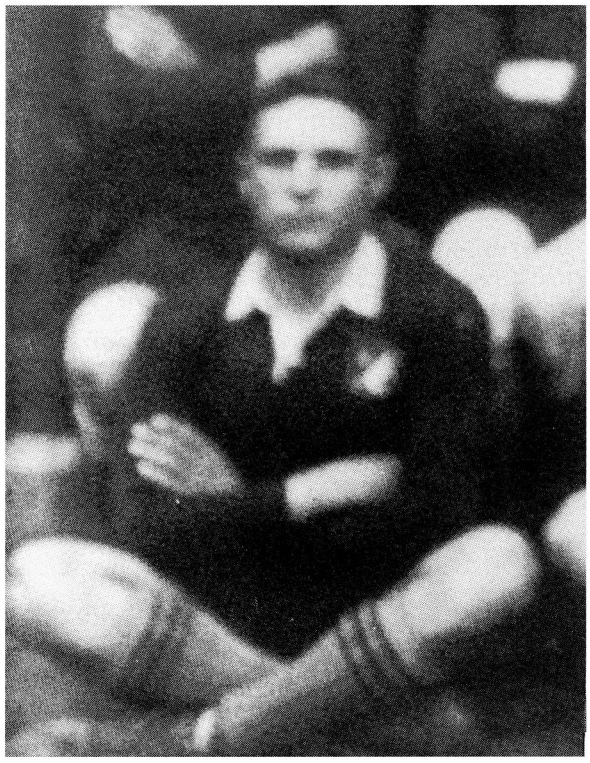

Fig. 18-2. Rugby player Brian Windeyer on the team of St. Andrew's College of the University of Sydney, 1923.

hands of dermatologists and general radiologists. In 1913 the total number of X-ray treatments administered at St. Thomas Hospital was only eighty-six.[530] At the end of the first World War, the R.A.F. made a temporary loan of five grams of radium to the Middlesex Hospital.[227] From these early events, radiotherapy took root in Britain.[132,450]

Neville Samuel Finzi (1881–1968),[B] an enthusiastic, tenacious, and hardworking man, stands as the outstanding pioneer of British radiotherapy. In 1909 he was already attempting to use a six hundred milligram radium source for telecurietherapy. In 1913 he published a book, *Radium Therapeutics,*[225] which places him historically far ahead of other pioneers. Painstakingly, he developed at the St. Bartholomew's Hospital of London what was probably the first comprehensive and well-equipped department of therapeutic radiology. His sympathetic colleagues formed an early Radiotherapeutics Research Committee.[227] In 1930 Walter Montague Levitt (1900–1983), another early British advocate of radiotherapy, produced a report of the results of X-ray therapy at St. Bart's revealing unsuspected possibilities of radiotherapy of cancer.[595,419,420] Finzi had already implemented tangential irradiation of cancer of the breast, sparing the lung.[226] Keynes reported on a considerable number of patients, including accounts of the use of elaborate interstitial implantation of radium needles on mammary tumors and on their axillary, supraclavicular, and internal-mammary nodes areas.[940]

In the 1930s it was the sustained public relations effort of the British Empire Cancer Campaign that awoke in Britain a widespread concern for the alarming increase in cancer mortality. Private and government funds combined to expand research laboratories, equip treatment facilities, build new ones, and finance the training of acutely needed professional and ancillary workers specially trained in various disciplines. The Marie Curie Hospital of London, an institution named for a woman, to be staffed by female physicians for the treatment of cancer in women, was planned and eventually opened.

As these events took place in England, Windeyer was receiving training in therapeutic radiology at the Radium Institute of Paris. After completing his service in Paris in 1930, Windeyer went to Edinburgh to prepare for and take examinations to qualify as a Fellow of the Royal College of Surgeons. Although he intended to return to Australia, he was tempted by a solicitation for applicants for a position as radium officer to the Middlesex Hospital of London. The hospital had a cancer wing and was anxious to attract a worthy candidate to take responsibility for the radium supplies used by surgeons, gynecologists, and dermatologists. Windeyer applied and, despite his youth and the fact that he was not a graduate of any of the prestigious English schools, was offered the appointment. Undoubtedly, the excellence of his recent training counted in his favor. He was given an office in the Department of Physics, of which Professor Sydney Russ (1879–1963) held the chair. The Department of Physics of the Middlesex Hospital, under Russ since 1912, had an early interest in the uses of radium. In 1919 a temporary loan of five grams of radium had allowed Dr. Russ to study radiobiologic ef-

Fig. 18-3. Oarsman Windeyer (fifth from right) on the St. Andrew's College cup-winning crew, 1924.

fects. It was this departmental interest in the medical applications of ionizing radiations that led to the appointment of Dr. Russ as professor of medical physics. It was this department also that welcomed and supported Windeyer as radium officer. Roentgentherapy continued to be the responsibility of the Department of Radiology as a subsidiary practice of radiodiagnosis.

In 1936 the hospital upgraded its radiotherapeutic facilities and gave Windeyer charge of its new Department of Radiotherapy. His skills as a clinical radiotherapist and his professional ethics promptly brought him the support of his colleagues on the hospital staff. His department acquired an excellent reputation as a cancer center in which various surgical specialists participated.

Within a short number of years, the work of the department garnered philanthropic attention. Thanks to the generosity of Sir Edward Meyerstein, the Middlesex cancer wing was remodeled and additional structures built to accommodate new facilities and equipment. In June 1938 Sir William Bragg, O.M., K.B.E., (1884–1964) inaugurated the Meyerstein Institute of Radio-Therapy, a self-contained unit with a separate entrance on Nassau Street and ample access to the Middlesex Hospital. The sections of radiumtherapy and roentgentherapy were unified in a single department of radiotherapy. The four-floor structure had sixty-four ward beds and six private rooms as well as an outpatient unit. The roentgentherapy facilities included one 100 kv unit for superficial roentgentherapy and several 200–220 kv units. Some of the units were fitted with "lighting localizers" for the outline of fields (Fig. 18-5) (subj. note 18.1). In addition, there was a four gram teleradium unit. Hammer and Mekapion integrometers were available to measure doses in roentgens at the portals of entry.

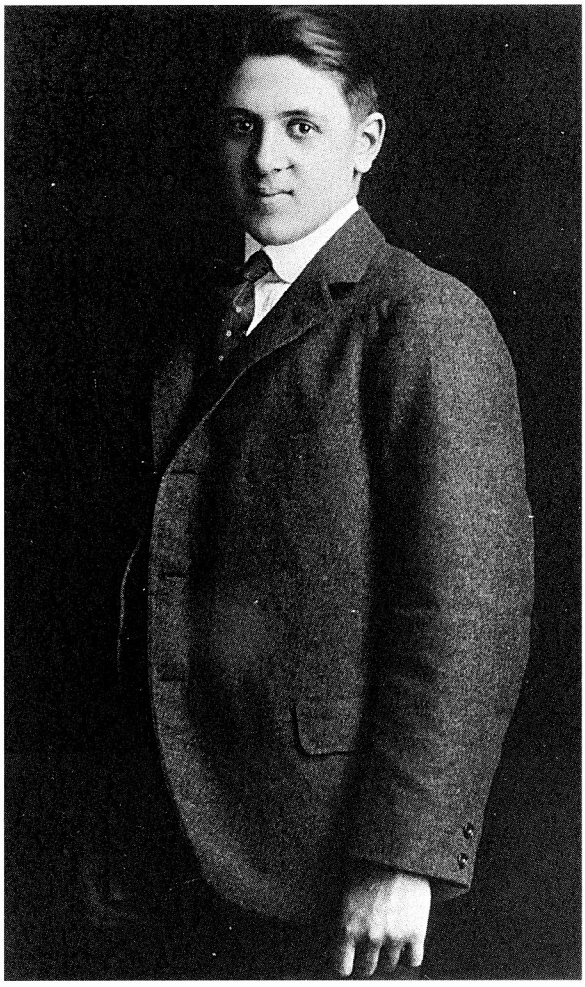

Fig. 18-4. Bachelor of Science and Medical Bachelor Brian Windeyer, 1927.

The Meyerstein Institute had been in operation only fifteen months when England entered the second World War. Windeyer was assigned the duties of Commandant of the Middlesex Hospital. He was to face the troublesome administrative work of the medical center, as well as continued responsibility for the radiotherapeutic demands of the Meyerstein Institute and the Mount Vernon Hospital, for the duration of the war.

In 1942 Windeyer was appointed professor of radiology (therapeutics) at the Middlesex Hospital by the University of London. No one had been appointed previously to this position. He lectured frequently and articulately on radiotherapy of cancer, often making revealing clinical distinctions. Speaking at the 22nd annual meeting of the British Association of Dermatology and Syphilology, he presented a paper on radiotherapy of cancer of the skin in which he discussed the relative advantages of roentgentherapy over radiumtherapy.[679] In 1943 he was invited to deliver the prestigious Erskine Lecture of the Faculty of Radiology. He reviewed the cases of 141 patients with carcinomas of the maxillo-ethmoidal region plus 12 cases of sarcoma. This was an important additional contribution to the conservative treatment and cure of such patients by means of radiotherapy.[680]

The end of the war brought renewed interest in the development of radiotherapeutics. Windeyer participated in a symposium of the British Institute of Radiology on dosage control in interstitial radiumtherapy. W. Jack Meredith (1913–),[B] of Manchester, and John Ramsbotton Nuttal (1903–1986), of Leeds, were also participants. Windeyer held the view that standardized methods with accurate dosimetry should be used in all cases to estimate their effectiveness, excesses, or failures.[681]

Brian Windeyer's marriage of many years ended in divorce, and Joyce Ziele returned to Australia. In

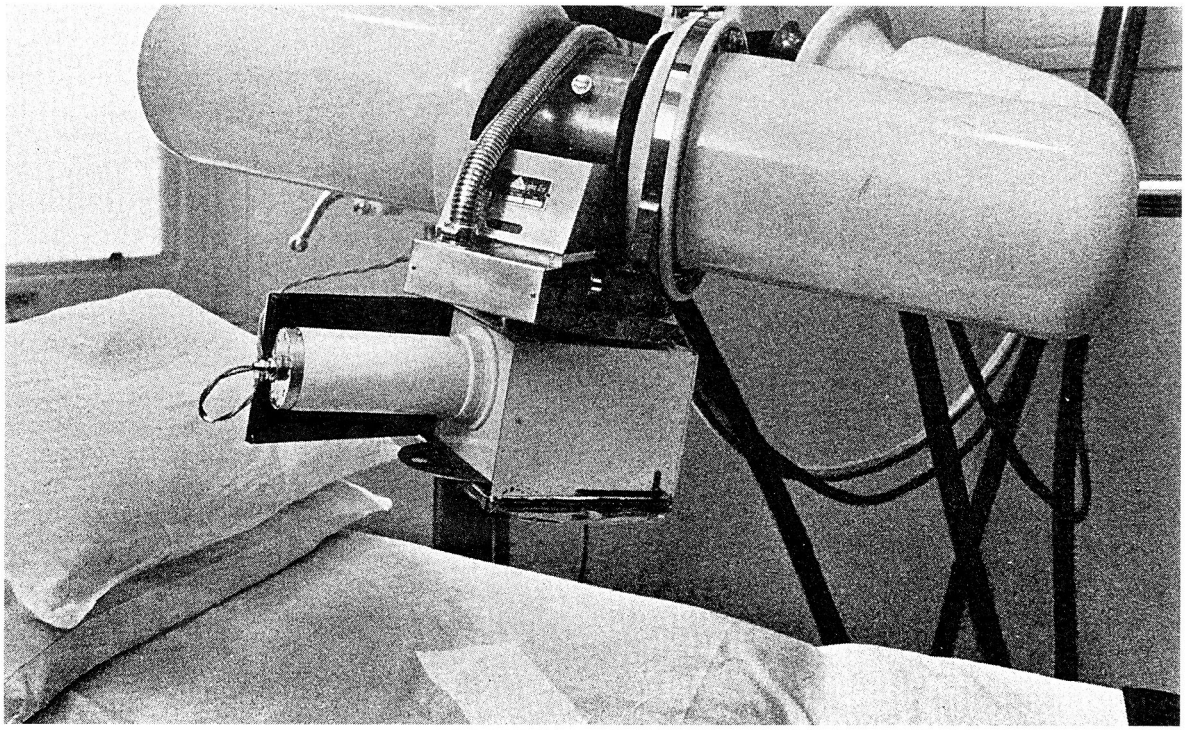

Fig. 18-5. Early 200 kv unit with tube-head "lighting localizer" projecting a beam of outline light on the surface of the couch.

January 1948 Windeyer married Elspeth Anne Bowery at Marylebone in London.

In 1948 at a time when there were scarcely sixty radiotherapists in the United States, when radiumtherapy was mostly done by surgeons, and roentgentherapy was a subsidiary practice of radiodiagnosticians, Windeyer was invited to address the Section on Radiology of the American Medical Association. In Chicago during the ninety-seventh annual meeting of the AMA, he told the story of the gradual development of British radiotherapy. Starting with the establishment of radium centers in 1929, roentgentherapy had become, in time, the responsibility of the radium officers, the first British physicians to practice radiotherapy exclusively. The advantage accrued by the aggregation brought the need for well-equipped departments of radiotherapy and comprehensive training of therapeutic radiologists. An official policy of centralization resulted in the concentration of cancer research in such centers as well.[648] Windeyer acknowledged the contributions of British physicists to radiotherapy and the fact that they had become members of the team.

Windeyer's address was discussed by two American professors of radiology who had long kept dual interests in radiodiagnosis and radiotherapy: Robert Reid Newell (1892–1965), of Stanford University, and Frederick William O'Brien,[B] of Tufts University. O'Brien agreed that radium and roentgentherapy should be entrusted to the same person. Newell wondered if the general radiologists hung onto radiotherapy "to convince themselves that they are doctors practicing the art of medicine."[684]

During his 1948 visit to the U.S., Windeyer also attended the 30th annual meeting of the American Radium Society. He had been invited to participate in a symposium on the results of the treatment of cancer of the tongue.[685] Other participants who had agreed to present their results according to pre-established rules were Juliette Baud[B] from Paris, Elis Berven[B] from Stockholm, and Sir Stanford Cade from London. Windeyer reported a 21% 5-year survival in a series of 230 patients. He also presented a paper on the treatment of cancer of the breast, in which he concluded that pre-operative irradiation of all operable tumors was a rational procedure.

The Meyerstein Institute and the Mount Vernon Hospital took advantage of the post-war availability of Co^{60} from Canada and the linear accelerator built in Cambridge by Ernest Thomas Sinton (1903–) and John Douglas Cockcroft (1877–1967). A model of the latter was being adapted to medical use. These additions to the armamentarium of radiotherapy gave new impetus and offered new hopes for improved methods in clinical radiotherapy. In 1949 Windeyer reported the results of various forms of treatment of thirty-eight patients with giant-cell tumors (osteoclastomas) of the bone, concluding that radiotherapy

Fig. 18-6. Dean Windeyer visiting Australia in the company of Sir Stanford Cade, ca. 1954.

alone was the treatment of choice. He observed that among those which later "became" malignant, the greater proportion had been treated surgically.[683]

In 1953 Windeyer contributed to a symposium on the treatment of carcinoma of the floor of the mouth. He reported a 29% absolute 5-year survival in a series of 125 patients treated by a combination of intraoral brachytherapy and submandibular telecurietherapy.[686] That same year, he delivered the Memorial Lecture in honor of Sir James Mackenzie Davidson (1856–1919), one of the most illustrious pioneers of radiology. It was a measured analysis of Windeyer's substantial experience with radiotherapy of thyroid tumors, concluding that radiotherapy has a definite role in their treatment.[687]

Windeyer was appointed part-time dean of the Middlesex Medical School in 1954 (Fig. 18-6). With characteristic calm and perseverance, he undertook the serious task of incorporating new scientific knowledge and abundant technological developments into the curriculum, without diminishing the students' opportunities to acquire fundamental clinical skills. Years later, in his valedictory address, he reviewed the serious tasks of medical schools, starting with choosing honest and thoughtful students with a thirst for scientific knowledge and a taste for clinical observation, young men and women capable of critical judgments, yet with a depth of kindness and a liking for people and their problems.[688,689]

In 1946 Professor Sydney Russ was succeeded by J. E. Roberts as Professor of Medical Physics; he faced a new challenge. Radioactive isotopes, which had become available after the war for use in diagnosis, therapy, and biological research, required a special laboratory. The departments of physics and radiotherapy assumed jointly the responsibility of the Radioisotopes Laboratory, with Dr. Roberts as director. The isotopes service grew rather rapidly, requiring additional talents. A radiochemist was added in 1948, but still more were needed. With the support of Dean Windeyer and the finances of the Nuffield Foundation, the Institute of Nuclear Medicine was established in 1961. Dr. Edward S. Williams succeeded Roberts as director of the new institution to be housed in its own building. Important functions of the institute were to provide teaching in nuclear medicine and to train workers for other centers. Thus, it became the only academic institution in the United Kingdom exclusively devoted to nuclear medicine.[658]

The experience gained in the integration of isotope services at Middlesex led Windeyer to a position of leadership in the development of other nuclear centers in England. His ideas and recommendations informed the activities of the Working Party of the Department of Health and Social Security, the Radioactive Substances Committee, and the Inter-Collegiate Committee on Nuclear Medicine of the Royal Colleges of London, Edinburgh, and Glasgow, which he chaired. In an address at the inauguration of a new nuclear center, the new Addenbrooke Hospital at Cambridge, Windeyer summarized these views and recommendations: that there should be established a number of well-equipped and comprehensively staffed nuclear centers capable of carrying out all recognized techniques of imaging, organ uptake, dynamic studies, and sample counting, as well as whole body tests and therapeutic uses (other than with sealed sources).

Dean Windeyer had long been a Fellow of the Faculty of Radiology, as well as its president from 1949 to 1952. He also became Hunterian Professor and Fellow of the Royal College of Surgeons *(ad eundem)* and Fellow of the Royal College of Physicians. In 1961 he was elevated to the honorable rank of Knight, as his grandfather had been (Figs. 18-7 and 18-8).

Sir Brian delivered in 1964 the first Gordon-Taylor Memorial Lecture before the Royal College of Surgeons, entitled "Sir Gordon Taylor, Surgeon, Ambassador, Scholar and Orator." In Dublin in 1965 he was invested as a Fellow of the Royal College of Surgeons of Ireland, and spoke of the progress of radiotherapy in Britain: within the short span of three decades, including the difficult war years, radiotherapy had risen to play a most important role in the treatment of cancer patients.[690] On that occasion, he reviewed the principal indications for radiotherapy. Clad as a doctor of science *(honoris causa)* of the University of Wales, Sir Brian delivered in Cardiff the first memorial lecture in honor of Glen C. D. Evans (1911–1961). He gave an account of the development of British education in radiology.[691] In Britain the Society of Radiotherapists and the Association of (diag-

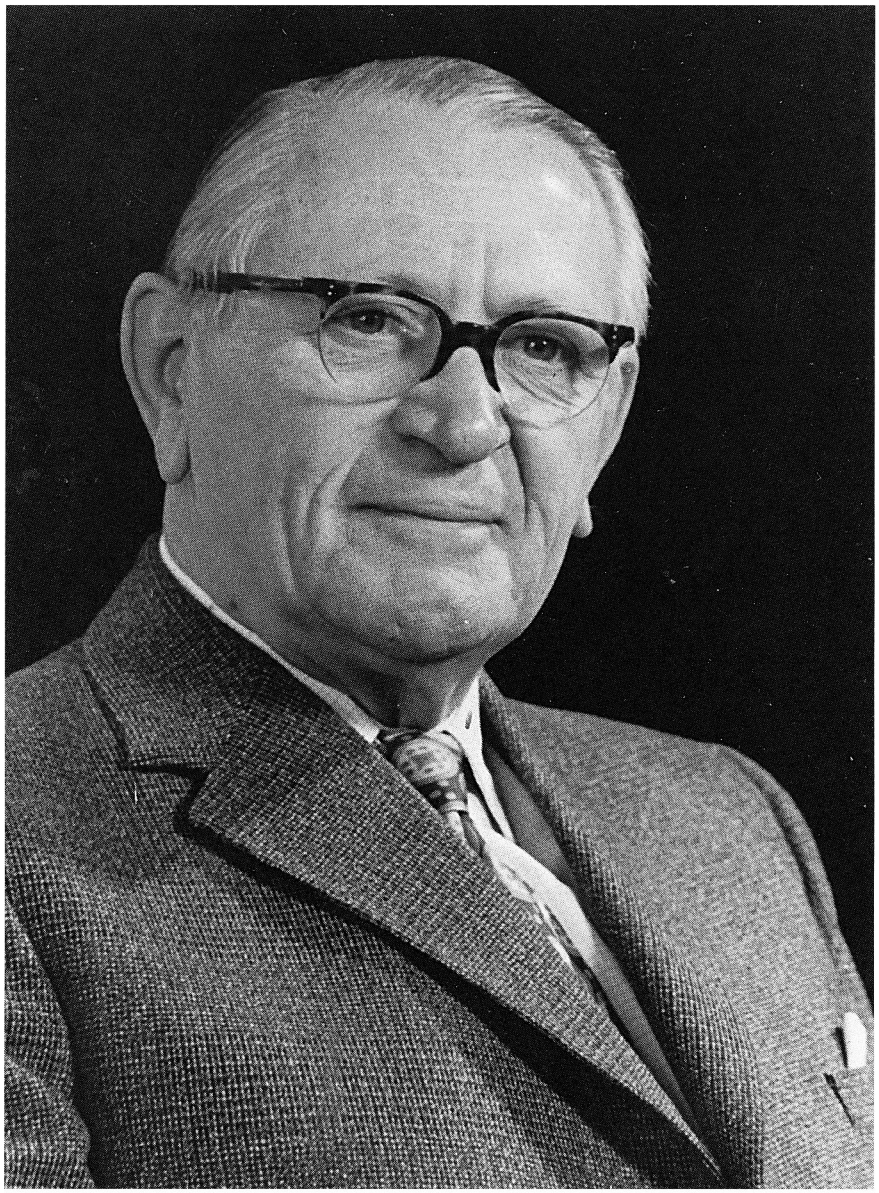

Fig. 18-7. Sir Brian Windeyer, M.B., F.R.C.P., F.F.R.

nostic) Radiologists had achieved independence from each other. Paradoxically, they sought each other's warmth and strength in a single guild and formed the Faculty of Radiology. This confraternity, now the Royal College of Radiology, assumed the burden and responsibility of establishing requirements for training and certification of both radiotherapists and radiodiagnosticians.

After thirteen years as a Dean, Sir Brian was elevated in 1967 to the higher responsibility of vice-chancellor of the University of London, in charge of all its colleges, of which twelve were medical schools. In 1971 he was offered an additional diploma, a Doctor of Science *(honoris causa)* from Cambridge University and an honorary L.L.D. degree from the University of Glasgow.

In his retirement, Sir Brian has been far from inactive. In 1978 he wrote the long awaited report of the Medical Research Council Working Party of hyperbaric oxygen and radiotherapy.[693] Fifteen years after the cooperative research group was established and some fifteen hundred patients had been entered in the study, the conclusions revealed some fundamental, if not sensational, facts. Hybaroxic radiotherapy results in increased radiosensitivity of both the neoplastic and normal tissues; thus, it does not increase the radiotherapeutic margin of safety. There was some evidence of greater primary control, but the observation was marred by the short life expectancy of the advanced disease of most patients entered. Trials on advanced cases proved disadvantageous. Hyperbaric oxygen did not worsen or accelerate the occurrence of metastases. The principal advantage gained was the experience of cooperative trials.[693] In this same year, Windeyer received another honorary M.D. degree from the University of Sydney.

A generous man with an unusual capacity for leadership and a chronic inability to deny requests for his help, Sir Brian has continued to work diligently for a variety of committees and commissions, many of which he has chaired: the Radioactive Substances Advisory Committee (1961–1970), the National Radiological Protection Board (1970–1978), the Matilda and Terence Kennedy Institute of Rheumatology (1970–1977), the Institute of Medical Education of the University of London (1974–1983), the Royal Commission on Education, the Grand Council and Executive Committee of the British Empire Cancer Campaign, the British Institute of Radiology, the Inter-Collegiate Committee on Nuclear Medicine, and many others.

In the view of one of his close associates, Sir Brian is "a man of the world, an excellent mixer with a sardonic view of society and a shrewd understanding of what makes people tick." He is also a fine clinician and dedicated teacher who has tutored and contributed by his example to the formation of a number of carefully-chosen younger associates.

The list of Windeyer's former Senior Registrars (Fellows) reads as a directory of distinguished therapeutic radiologists who have won a reputation for themselves: Thomas Wynter Backhousse (1922–) became radiotherapist to the Coventry and Warwickshire Hospitals; Norman Montague Bleehen (1930–), Windeyer's successor as Professor and Chairman at the Middlesex School, is Head of the Department of Oncology and Radiotherapy of the Addenbrooke Hospital of Cambridge; Harris Julian Carter Bloom (1923–198?), a fine clinician with a thorough background of tumor pathology, became radiotherapist to the Royal Marsden Hospital of London, and well known for his work on the hormone dependence of renal tumors and for radiotherapy of central nervous tumors. Peter Ernest Bodkin (1921–) became radiotherapist to the Western Regional Radiotherapy Center, Hampshire; Irene Margaret Stanford Cade

Fig. 18-8. Armorial bearings of Sir Brian Wellingham Windeyer: the William Tell apple and the bear for Switzerland; the wattle (mimosa) for Australia.

(1925–) went on to be radiotherapist of the Portsmouth Radiotherapy Center; Robert John Dickson (1918–) was on the staff of the Mount Vernon Hospital; Stanley Dische (1927–), after a short stint in Philadelphia, returned to become a Life Fellow of the Cancer Research Campaign at the Marie Curie Wing of Mount Vernon; Matthew Lewis Fenner (–1980) became radiotherapist to the British Radiotherapy Center; Gerard Edward Flatman (1921–), became Deputy Director of the Glasgow Regional Radiotherapy Center; Elizabeth Jane Grosh (1939–) entered the Mount Vernon staff; Max Hulbert became senior radiotherapist of the Saint Mary's Hospital of London; Anthony Michael Jeliffe (1923–) was on the staff at Mount Vernon; Donald Leslie Phillips (1925–) became radiotherapist to the Southend Regional Radiotherapy Center; Leon Gaston Piscciotto (–1986) was a senior consultant at Mount Vernon; Margaret Snelling was Windeyer's successor as Director of the Meyerstein Institute, and active in professional British and international organizations; Paul Strickland (1921–) was Chairman of the Department of Radiotherapy at Mount Vernon until his retirement in 1986; William Roy Ward was Deputy Director at Mount Vernon; and Thomas Stanley Worthy (1923–) practiced radiotherapy in Cambridge and Leeds.

Some among Sir Brian's young associates went abroad: Larry Atkinson emigrated to Australia, and died there; José Francisco Bohorquez (1930–), a 1956 graduate of the University of Guayaquil, Ecuador, went to the United States where he has been successively Director of Radiotherapy at the New York Downstate Medical Center (S.U.N.Y.), Professor and Chairman of Radiotherapy at Ohio State University, and Professor and Chairman of Therapeutic Radiology at Union University Medical College of Albany, New York; Erwin Maximillian Japha (1910–1971), a 1938 graduate of the Middlesex School, went to Chicago where he was Professor of Radiology and Director of Radiotherapy at the Mount Sinai Hospital; Simon Kramer (1919–), a 1942 graduate of the Middlesex School, went to Manitoba and thence to Philadelphia where he became Director of Radiotherapy and Professor and Chairman of Therapeutic Radiology at the Jefferson University Medical College; Charles Leonard Lewis (1917–), a 1943 graduate of the University of Leeds, went to Rochester, New York, and became Professor of Radiology and Director of Radiotherapy at the Rochester General Hospital (subj. note 18.2).

An altruistic scholar and a truly peripatetic radiation oncologist, Sir Brian has put to fruitful use his leisure time and his appetite for traveling. He has generously offered his experience and advice to medical organizations far away from the British Isles. In Holland (1951), South Africa (1961), Czechoslovakia (1965), Canada (1965), Iran (1975), Austria (1977), Italy and India (1978), Singapore (1979), Greece (1981), Malaysia (1981), Israel (1986), and Australia *(ad libitum),* he has lectured on medicine, consistently and eloquently, on education, the problems of cancer, therapeutic radiology, and the "philosophy" of radiation protection.[694] In addition he has given considerable time and dedication to related activities of the World Health Organization.

Sir Brian has five children: Michael Russell (1933–) and Joanne Russell (1936–) from his marriage to Joyce Ziele Russell; Francis Bruce (1949–), Kyla Jane (1954–), and Elspeth (1957–) with Lady Anne. Two married daughters live in Australia, another in Kuwait. One of his sons married an Australian and lives in England.

Unspoiled by titles, honors, and positions of great distinction but endowed with inward grace, Sir Brian has remained an affable colleague, a dedicated teacher, and a compassionate physician. Besides his contributions as an educator, he has been the leading proponent of clinical radiotherapy in his country and its devoted missionary abroad. He and Lady Anne now live in picturesque Oxford, in highly intellectual surroundings, not far from the river where a new generation of oarsmen can often be observed, particularly during Eight's Week when they race their shells on the Isis.

Early in 1987, after his eighty-third birthday, Sir Brian and Lady Anne were planning a trip to Paris to witness the France-Scotland rugby match, thence to Kuwait and again to Australia!

Subject Notes

18.1 In early Coolidge tubes used in radiotherapy, light from the filament reflected on the target produced a beam of light used to outline fields on the patients. With the advent of shockproof closed tubes, no light was available for the purpose. The lighting device was designed by J.A. del Regato in Paris. Interposed in the beam of X rays, the device provided a beam of light with the same dispersion as the X rays. To make the device available to Dr. Jean S. Riach for the Marie Curie Hospital of London (1934), the design was made available to Harold A. Quinton, of Metropolitan Vickers. In 1937 in the United States, at the request of the Chicago Tumor Institute, the "localizer," with additional underlying lead diaphragms, was first built and subsequently adopted for the General Electric Maximars. Later, Keleket, Westinghouse, and Picker also adopted it for their radiotherapy units. In 1940, acting on suggestions by del Regato to Prof. George Holmes, the M.I.T. engineers built in a lighting localizer for the second Van de Graaf unit at the Massachusetts General Hospital in Boston. Some of the first Co^{60} units and medical linear accelerators adapted the principle and came equipped with a lighting device. The F-R Machine Works of Long Is-

land commercially produced a "Regato Localizer," which was adaptable to any unit. The original designs, documents, and a prototype of the lighting localizer are at the Smithsonian Institution in Washington D.C.

18.2 To the list of close associates a long list of students could be added: they came from all parts and carried away with them the very best example of clinical radiotherapy. Among Windeyer's associates in physics the following must be counted: D.E.A. Jones, former chief physicist; Raymond S. Bush, who went to Toronto; J.F. Fowler, Chief Scientific Officer of the British Department of Health and Social Security; and Alfred Gregory.