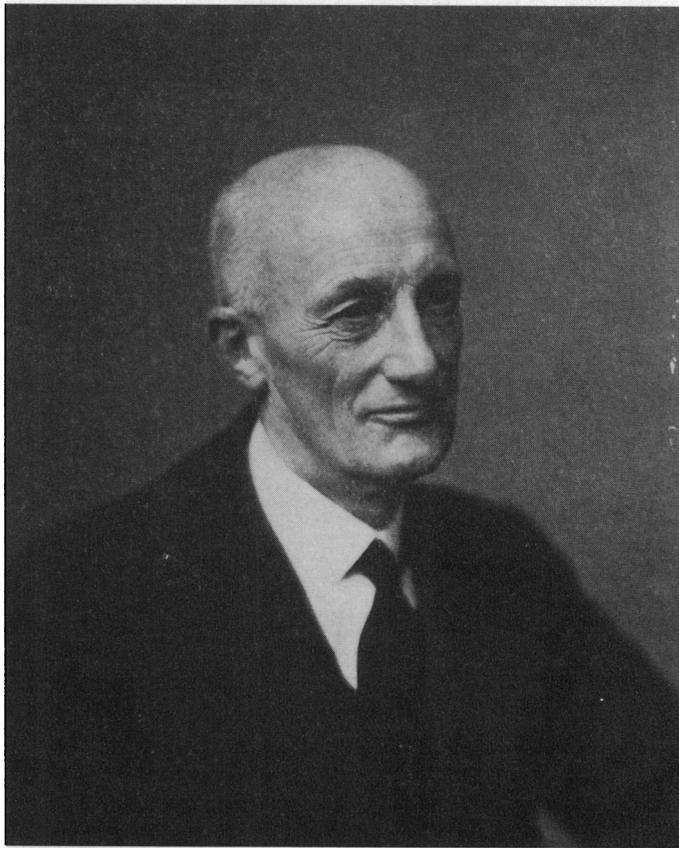


SIR FRANCIS FRASER



[*Bassano, Vandyke, Elliot and Fry*]

The death of Francis Richard Fraser at the age of 79 has removed a leading academic and administrative figure from the scene of British medicine. Undergraduate medical education felt his influence from 1920 onwards during his tenure of the Chair of Medicine at St. Bartholomew's Medical School. Then in 1934 when the first steps were taken to develop postgraduate medical education, Fraser's prestige and influence made him the obvious choice as Professor of Medicine at the Postgraduate Medical School at Hammersmith. The astonishing progress and development of postgraduate medicine in Britain from then until now has owed much to Fraser's inspiration and enthusiasm both as the Professor at the Postgraduate Medical School and later as architect of the Postgraduate Medical Federation of the University of London. Other journals have, however, dealt with Fraser's achievement in medical administration and education, and it remains for this journal to examine his contribution to medicine at a more personal level.

Bart's in the early twenties received Fraser coldly and critically. What was a school dominated by the great medical and surgical exponents of the clinical art and skill to make of this slim white-

coated figure who walked briskly, talked in a loud voice, used a blackboard in the wards, and pooh-poohed dogma? The spirit of the medical unit which grew up within the hallowed walls of the Smithfield school was too questioning for comfort, for the aim of Fraser's work was the encouragement of the inquiring mind not merely in the interest of diagnosis but in the quest for knowledge of the causes and mechanisms of disease. Fraser regarded the medical unit as an instrument for educating both students and staff in the scientific basis of medicine in its widest sense. He never sought to sweep away the traditional basis for medical education but he introduced new instruments for teaching such as clinico-pathological conferences and the weekly staff round. The medical unit at Bart's became a cradle for medical scientists as well as for clinicians and to many it was the place where a vocational fire was kindled which has lasted throughout their lives. Yet there were those who did not share the sense of exhilaration and who were sceptical of the close approach of the laboratory to the temple of healing. If justification were needed, Fraser's participation in the first trials of liver in the treatment of pernicious anæmia and his collaboration with the late Sir Thomas Dunhill in the medical and surgical treatment of thyrotoxicosis should have been an adequate reply. Yet even Fraser's critics could not deny his dynamic power; for the source of this, it may be worth while looking at his earlier life.

The Medical School at Edinburgh in the early years of this century, which Fraser joined from Cambridge, included many distinguished physicians, but in 1912 a chance meeting with Abraham Flexner led to an invitation to become an assistant to Simon Flexner at the Hospital of the Rockefeller Institute, New York. Work in contiguity with men such as van Slyke, Means, and Cohn in the atmosphere of critical inquiry at the Rockefeller followed by an appointment with Longcope at the birth of academic medicine at the Presbyterian Hospital may well have aroused the fire which Fraser was later to transmit to others. Soon after this the war took Fraser to France as pathologist to the Harvard University Unit and later he was consulting physician to the Army of the Rhine. This then was the background to the appointment at Bart's and revival of his career in academic medicine.

Fraser's early interest in cardiology appeared when he worked in New York with Cohn on digitalis and on the electrocardiographic changes induced by its administration. Later from Bart's there came papers on digitalis and quinidine in the treatment of auricular fibrillation, on thyrotoxic heart disease, on the use of diuretics, and the reaction of the blood in relation to dyspnoea. The Goulstonian Lectures delivered in 1927 discussed critically the findings of a team that included George Graham, Charles Harris, Reginald Hilton, and G. C. Linder who studied the chemical changes in the blood in patients with cardiac dyspnoea. Careful measurements of the oxygen content and saturation, the CO₂ content and tension, and the pH of the arterial blood in various cardiac disorders showed conclusively that the chemical composition of the arterial blood could not serve as an explanation of the excess ventilation of dyspnoea. The alternative theory of inadequate blood supply to the respiratory centre could not be substantiated because of the limitation of the techniques available in 1927 for measuring the cardiac output. It is interesting to recall that explanations for cardiac dyspnoea are nearly as elusive today as they were when Fraser summarized the work of his colleagues.

At this period of Fraser's life, he was an active member of the Cardiac Club of which he was one of the first to be elected in 1923 to join the original 15 members. His physiological and scientific approach added greatly to their discussions and when, at a dinner in 1935, he proposed the health of the secretary, he took the opportunity to suggest the transformation of the club into a society. Thus came into existence the British Cardiac Society and its journal the *British Heart Journal*, whose editorial board benefited from Fraser's experience with the *Quarterly Journal of Medicine*.

To return, however, to Fraser's own work: the experimental study of the autonomic nervous system and the elucidation of the action of acetyl choline in animals and its potentiation by eserine had aroused his interest. In 1933 Fraser and Carmichael, then an assistant on the Medical Unit at Bart's, showed that intravenous injection of acetyl choline in man caused slowing of the heart rate, which was potentiated by eserine and abolished by atropine. There followed a series of clinical

observations on acetyl choline, most of which were made in the new Department of Medicine which Fraser and his whole-time staff occupied in the British Postgraduate Medical School when it opened in 1935.

Most of the early years at Hammersmith were spent in laying the foundations of the high standard of clinical work and of investigation proper to a modern teaching hospital. But Fraser brought together men with interests in special subjects as, for instance, Scadding in chest disease, Wood in cardiology, and Sharpey-Schafer who was to develop endocrinology. The availability of choline derivatives such as mecholine and the new work on prostigmine in myasthenia gravis led Fraser to encourage his assistants to undertake studies in this field. Wood demonstrated the action of mecholine in paroxysmal tachycardia, McGeorge studied choline esterase in the serum, and Fraser himself assembled a remarkable series of patients with myasthenia gravis. The work thus done led to the Croonian Lectures on "Clinical aspects of the transmission of the effects of nervous impulses by acetyl choline" delivered in 1938. These lectures epitomized the extension to man of observations begun in experimental laboratories and the harnessing of new knowledge for the better treatment of patients and the understanding of the mechanisms of disease. Fraser himself never talked of his personal researches as though he was one of the exponents of clinical research, yet the organizations that he fostered provided precisely the atmosphere that young clinicians in their creative years required. On the foundations laid by Francis Fraser in the Postgraduate School, clinical research there has become firmly established as an essential discipline linked indissolubly with teaching and the care of patients.

British cardiology, however, owed Fraser much more than the work just outlined. When the special Postgraduate Institutes of the University of London came into being after the second world war, the National Heart Hospital was chosen in 1947 for cardiology. The late Paul Wood became in 1949 the first Director of the Cardiology Institute, and much of the success which he achieved in overcoming difficulties stemmed from Fraser's support and that afforded also by John Parkinson. In 1963, when the new South Block of the National Heart Hospital was opened by the Minister of Health, a ward was named after Francis Fraser as a tribute to his great help. Those present on this occasion found Fraser much frailer than before, yet a characteristic leap over a desk to reach his seat without disturbing those around him showed that he still possessed a little of that abounding energy. The Heart Hospital will miss him and so will the Postgraduate School where also the laboratories of the Department of Medicine commemorate his name.

Few people know much of Fraser's life outside his work. Holidays before the last war were family affairs and were invariably taken in Scotland where he was able to indulge a love of nature and incidentally add to a collection of mosses and ferns. His main recreation was fishing but even while fishing he always wore fieldglasses round his neck for he became much interested in bird-watching. He retained a student liking for sport throughout his life and used to attend the Oxford and Cambridge rugby match regularly. An interest in classical music developed during the war and helped him greatly during the last months when his health began to fail. He read widely outside his subject and as Chairman of the University of London Library Committee had access to a wide variety of books of which natural history, geology, archæology, and travel were his chief joy.

Fraser's son and step-daughters were privileged to know at close quarters the warmth and understanding which he showed to others such as his house-physicians or students. Many knew that if they turned to him for advice they would not ask in vain. A half-hour in his company brought a sense of exhilaration and purpose as problems were discussed and solutions suggested in that clear incisive way which was peculiarly his. His memory will remain and he will be mourned by a much wider circle of men and women than is usual for so academic a man.

C. H. STUART-HARRIS

Sir Francis Fraser published over 70 original articles, lectures, and addresses. The following are selected as representative of the more important publications.

(a) *General Medicine*

1913. Passive human carriage of the virus of poliomyelitis. *J. Amer. med. Ass.*, **60**, 201 (with S. Flexner and P. F. Clark).
 Study of the cerebrospinal fluid in acute poliomyelitis. *J. exp. Med.*, **58**, 242.
1914. Clinical observations on ninety cases of acute epidemic poliomyelitis. *Amer. J. med. Sci.*, **148**, 1.
1924. Tularæmia in man from laboratory infection. *Quart. J. Med.*, **17**, 365 (with J. C. G. Ledingham).
1927. The part played by calcium in the living organism. *Brit. med. J.*, **ii**, 777.
1928. Treatment of pernicious anæmia with liver. *Brit. med. J.*, **i**, 165 (with H. F. Brewer and A. Q. Wells).
1931. Toxic goitre. The course of the disease and its treatment. *Brit. med. J.*, **ii**, 739.
1933. The diagnosis and treatment of generalized osteitis fibrosa with hyperparathyroidism. *Brit. J. Surg.*, **20**, 479 (with R. C. Elmslie, T. P. Dunhill, R. M. Vick, C. F. Harris, and J. A. Dauphinee).
1935. Prognosis in exophthalmic goitre. *Lancet*, **i**, 877.
1937. Clinical aspects of hyperthyroidism. *Brit. med. J.*, **i**, 84 (with T. P. Dunhill).

(b) *Cardiology*

1913. Paroxysmal tachycardia and the effect of stimulation on the vagus nerves by pressure. *Heart*, **5**, 93 (with A. E. Cohn).
1915. The influence of digitalis in the T-wave of the human electrocardiogram. *J. exp. Med.*, **21**, 593 (with A. E. Cohn and R. A. Jamieson).
1918. The sympathetic nervous system and the irritable heart of soldiers. *Brit. med. J.*, **ii**, 27 (with R. M. Wilson).
1922. Reaction of the blood in relation to dyspnœa. *Quart. J. Med.*, **15**, 193 (with J. P. Ross and N. B. Dreyer).
 Rapid digitalis effects by oral administration. *Lancet*, **ii**, 703.
1923. The use of quinidine in auricular fibrillation. *Brit. med. J.*, **i**, 507.
1924. Auricular fibrillation in thyrotoxic conditions. *Quart. J. Med.*, **17**, 326.
 Comparison of blood curves constructed with arterial and with venous blood. *J. Physiol.*, **59**, 221 (with G. Graham and R. Hilton).
1927. Cardiac dyspnœa (Goulstonian Lectures for 1927). *Lancet*, **i**, 429, 589, 643.
1928. The arterial blood in ammonium chloride acidosis. *J. Physiol.*, **65**, 412 (with J. B. S. Haldane, G. C. Linder and R. Hilton).
 Arterial carbon dioxide pressure in cardiac dyspnœa. *Quart. J. Med.*, **22**, 1 (with C. F. Harris, R. Hilton and G. C. Linder).
1933. Effects of acetylcholine in man. *Heart*, **16**, 263 (with E. A. Carmichael).
1938. Clinical aspects of the transmission of the effects of nervous impulses by acetylcholine (Croonian Lectures for 1938). *Brit. med. J.*, **i**, 1249, 1293, 1349.

(c) *Medical Education and general addresses*

1929. The place of human physiology in the training of medical students. *Brit. med. J.*, **ii**, 379.
1946. Postgraduate education and the National Health Service. *Brit. med. J.*, **ii**, 353.
1949. Medicine in the social order (Royal Medical Society, Edinburgh). *Lancet*, **i**, 131.
1952. Power and responsibility (opening sessional address, University of Sheffield Medical School). *Lancet*, **i**, 61.
 Postgraduate education. *Brit. med. J.*, **ii**, 455.
1958. Medicine practice in a changing Society (Glasgow Faculty of the College of General Practitioners). *Lancet*, **i**, 154.
1960. Challenge to the medical profession. Harveian Oration of the Royal College of Physicians of London.
1962. The rise of specialism and the special hospitals. (3rd British Congress on the History of Medicine and Pharmacy), Pitman Publishing Co., Ltd., "The evolution of hospitals in Britain".