Sir Thomas R. Fraser. By Harry Rainy, M.A., M.B., C.M., F.R.C.P. Ed.

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By the death of Sir Thomas Richard Fraser on 4th January 1920 the Royal Society and the University of Edinburgh have lost one of their most distinguished ornaments, who, by the extent and carefulness of his research work, gained a European reputation, and left behind him an example that must serve as an inspiration to his successors in the department to which he devoted himself. He was born in Calcutta on the 5th of February 1841, and his education, both at school and at the university, was Scottish. In the Edinburgh University he had the advantage of having such men as Sir Lyon Playfair, Hughes Bennett, Sir James Simpson, and Sir Robert Christison as his teachers, whilst amongst his fellow-students and colleagues in later life he reckoned men like Professor Rutherford, Sir Thomas Grainger Stewart, Sir William Turner, Professor Crum Brown, Professor Sanders, and Lord Lister. Under the stimulus of such associates it is not surprising to find that he made his mark even whilst he was a student, and that his graduation thesis in 1862, of which the subject was "On the Characters, Actions, and Therapeutic Uses of the Ordeal Bean of Calabar" (*Physostigma venenosum*), embodied a research of the highest order, which brought him into prominence both at home and abroad, winning for him, in association with a later paper on the same subject which appeared in the *Transactions of the Royal Society*, the Barbier Prize of the Academy of Sciences of Paris, which he received in 1868. Shortly after graduation he acted as resident physician in the Royal Infirmary, and in 1869 he was appointed assistant physician to the Infirmary. In 1863, largely on the strength of his research work, he was chosen assistant to the Professor of Materia Medica, a post which he held until 1870, when he relinquished it in order to become a lecturer on materia medica and therapeutics in the Extra-Mural School of Medicine. Four years later he was appointed medical officer of health for Mid-Cheshire, a district which at that time included a population of over 123,000 persons. In those days the work which fell to be discharged by a medical officer was less sharply defined than it is at the present time, and Dr Fraser's methodical mind and organising capacity led to the development of his work in a way which can scarcely be appreciated by

those who nowadays have their duties much more explicitly laid down. At this time the Public Health Act had just been placed on the Statute-Book, and the amount of organising work that fell to Dr Fraser may be more readily realised when it is observed that not only did the administrative area extend over fully one half of Cheshire, but that it was divided into twelve districts under twelve boards of guardians both rural and urban, and that the medical officer of health had several inspectors and assistant inspectors under him, whose work was entirely guided by him, and who constantly reported directly to him on all matters of importance. His time was thus from the first occupied by the public service, and he never undertook any private practice in the district. Sir Thomas Fraser himself always laid stress on the importance of this time, not only because of its opening up a new field of work to him, but also because the comparatively regular duties enabled him to indulge in a certain amount of open-air recreation, such as working in his garden and even riding to hounds on occasion. To this he attributed the fact that his health, which had been considerably strained by the arduous tasks of original research, was much improved, and the relaxation enabled him on his return to Edinburgh to undertake further research with a better prospect of being physically able to stand the strain of the work. Another factor which greatly assisted him in the discharge of all these duties was the hearty co-operation of his wife, Lady Fraser, a daughter of the Rev. R. Duncan, whom he married in 1874, without whose constant care for over forty-five years he would scarcely have been able to complete the tasks to which he devoted his life.

On many occasions Sir Thomas Fraser was accustomed to say that he thought that in all research work there is a very considerable element of chance in the success of the undertaking. But whether this is so or not, it is a striking fact that nothing that he touched failed to become interesting and valuable, and, without denying the possibility of a certain degree of good fortune in the way in which his topics developed, a great deal more is attributable to the sound judgment with which he selected the various subjects of his investigations, and the extreme conscientiousness and ability which he displayed in even the smallest details of the research.

In 1877 the death of Sir Robert Christison made a vacancy in the chair of Materia Medica, and Dr Fraser at once became an applicant. By that time his contributions in various branches of research in materia medica had become extensive, and his application contained the titles of no less than twenty-one important contributions, as well as references to numerous papers which were written for the *Edinburgh Medical Journal* and other

scientific publications. Amongst the most important of these contributions, in addition to researches founded on his thesis on the Calabar bean, were a series of papers in which he was associated with Professor Crum Brown, "On the Connection between Chemical Constitution and Physiological Action," which in many respects formed the basis of much of the work which was done in the production of new drugs in the following fifty years, and which are still of outstanding importance. They were early recognised as epoch-making, and received recognition by the award of the Makdougall Brisbane Prize by the Royal Society of Edinburgh in 1868. During the same time he published papers on the "Antagonism between the Actions of Physostigma and Belladonna," thus showing how the opposing actions of their active principles could be made to fulfil the century-old desideratum of Goethe for drugs which would precisely neutralise each other's action. During the same time he also published a short investigation in the *Journal of Anatomy and Physiology* on the effects of rowing on the circulation, which emphasises the fact that he was always a keen supporter and at one time a member of the Edinburgh University Boat Club. Although latterly his health prevented his taking any practical share in the work, he never lost his interest in the club, and was always its loyal supporter in every difficulty.

It was striking to note, in the case of so young a man as Dr Fraser was when he applied for the chair, how many of the leaders in pharmacology throughout the whole Continent knew him by his work and were supporters of his candidature. No fewer than five eminent French professors, including Dujardin-Beaumetz and Paul Bert, were reckoned amongst their number, whilst eleven German and three American teachers also warmly supported his claims, giving him strongly worded testimonials. It is only necessary as an illustration to quote the last paragraph of the testimonial which he received from Schmiedeberg, who was then the illustrious professor of pharmacology in Strasbourg: "It would be superfluous for me to enter into further details concerning your successful scientific career; not only in your own department, but in still wider circles, it is sufficiently known and it is valued and esteemed by all. I have thus always been of the opinion that no one is so worthy of the honour of being Sir Robert Christison's successor as you, most honoured colleague, for you are already his intellectual successor. In the interest of that science which I also have the honour to represent, it is my sincere wish that you may be successful in obtaining this chair, so that you may be in a position to enrich, as heretofore, the sciences of materia medica and toxicology by new observations and discoveries." To those who know how careful Schmiedeberg

always was in giving testimonials of this nature, such an encomium proves better than almost any other how greatly Fraser's work had impressed the minds of these Continental leaders whose opinions were worth consideration.

His accession to the chair brought increased responsibilities in connection with his duties at the Royal Infirmary, where, as a clinical professor, he now took charge of wards with the status of a full physician. But, in spite of the extra labours thus thrown upon him, we find a continuous succession of papers on subjects of the utmost scientific and clinical value rapidly succeeding one another in the following years. The subjects of some of these researches had already occupied his attention before he returned as a professor to Edinburgh. Amongst these a series of papers on Strophanthus and other digitalis bodies was specially noteworthy, and the subject was only laid aside from time to time with a view to returning to it later. Thus his paper, published in early days, on the Kombé arrow poison was followed by a long series of communications on the various varieties of Strophanthus and their selective actions, many of which appeared in the *Transactions of the Royal Society*. This series of papers was recognised by the awarding to him of the Keith Prize by the Royal Society of Edinburgh for the period 1891–93. During this time he also wrote on various other arrow poisons, on snake venom, and the anti-venomous properties of bile.

Whilst carrying on all this research, as well as the ordinary duties of lecturing systematically on materia medica, Professor Fraser developed great powers as a clinical teacher, and many of the students who knew comparatively little of his laboratory research work felt that his teaching in the wards, whilst he was still in full vigour, was an inspiration. The scrupulous care with which he established the clinical facts of each case he examined, the clear logic of his deductions, and the reasoned lines of treatment did much to impress upon his hearers the conviction that clinical medicine could almost be raised to the level of an exact science. Three qualities he possessed in notable degree: accurate observation, clearness of vision which refused to be drawn away by side issues, and an indomitable will which triumphed to the end over ill-health and bodily weakness. His intimate knowledge of materia medica found the fullest scope in combating disease in the wards under his charge, and whilst, to the mere research worker, there may have seemed to be a lack of application of his researches to clinical uses, those who were privileged to be his students were able to contradict that impression by their daily experience in the wards. As a clinical teacher he has left as a legacy to the school

that tradition of high ideals and of exacting standards of duty which were characteristic of all his work.

A break occurred in his teaching in the school during 1898, when he went to India to act as president of a commission appointed to inquire into the whole question of bubonic plague, its origin, transmission, and treatment. His capacity and accuracy in detail made itself manifest at once, and a voluminous report was issued in 1901 which threw considerable light on the subject of inquiry.

In addition to his academic work, Professor Fraser filled many important positions in the scientific world, and even before he received his commission to the Edinburgh chair he was engaged, at the request of the Admiralty, as a member of the committee to inquire into and report on the causes of scurvy which broke out in Sir G. Nares' Arctic expedition. On a subsequent occasion he acted as president of the section of materia medica and pharmacology at the London meeting of the International Congress.

It was natural that a man of Sir Thomas Fraser's clear thinking and business capacity should become interested in professional matters outside the duties of his chair, and we find that he occupied many responsible positions where his powers in this direction could find scope. For twenty years, from 1880 onwards, he acted as Dean of the Medical Faculty in Edinburgh University. He was also a member of the University Court from 1904 to 1913, and in 1905 he became University representative on the General Medical Council, of which body he remained a member for ten years; and during that time, amongst other tasks, he took an active part in the 1914 issue of the British Pharmacopœia. For many years he was the valued principal medical adviser of the Standard Life Assurance Company, and in that capacity his sound judgment and keen critical instincts made him a more than usually competent guide in the difficult problems which constantly emerge in such work. He also discharged for nearly twenty-four years the duties of consulting medical adviser to the Prison Commissioners for Scotland, in which capacity his tact and judgment repeatedly proved of great service.

His distinguished career as a research worker also brought him many well-earned honours. At an early age, even before he had obtained a chair in Edinburgh, he had been elected a member of the Royal Societies of Edinburgh and London, and had been laureated by the Institute of France. At subsequent dates he received the recognition of the Turin Academy of Medicine and of the College of Physicians of Philadelphia. He was created an Honorary M.D. of Dublin, an Honorary Sc.D. of Cambridge, and received the degree of LL.D. from the Aberdeen and

Glasgow Universities. On the death of Sir William Gairdner in 1907, Sir Thomas Fraser succeeded him as Honorary Physician to His Majesty the King in Scotland, the honour of knighthood having previously been conferred on him in 1902. During the years 1900 to 1902 he filled the Presidential chair at the Royal College of Physicians of Edinburgh, and discharged its duties with great efficiency. In 1913 he was elected a member of the Athenæum Club under the special rule authorising the committee to elect nine members in each year because of their distinguished eminence in Science, Literature, or the Arts, or for public services. This distinction Sir Thomas Fraser highly appreciated.

On retiring from his Professorship in 1919 he was laureated LL.D. of the Edinburgh University, and his portrait, painted by Mr Robert Home, was presented to him by a large number of his former students, colleagues, and professional friends.

During his earlier years, Professor Fraser, though never very robust, was of a wiry constitution, and took great pleasure in many forms of outdoor exercise. But, as the years passed on, he suffered from repeated attacks of bronchitis which sapped his vitality, and rendered strenuous efforts difficult or impossible, and at the age of seventy he fractured his femur, thus rendering himself still less fit for physical exercise. For many years he spent his summer holidays at Druimbeg, a small country property which he purchased for himself on the shores of Loch Shiel in Argyllshire, where he delighted in showing hospitality to his friends, and where his garden, stocked with numerous plants of therapeutic interest and of beauty of foliage, gave him constant interest and pleasure. Whilst his strength enabled him, he also enjoyed the sports of trout-fishing, shooting, and hill-climbing, though he gradually had to abandon these amusements as his health became less satisfactory. To the end, however, his mind was as clear as ever, and when overtaken by his last illness he was busily engaged in working up the material which he had accumulated in the course of his long life of clinical and laboratory research.

In many respects Sir Thomas Fraser's position in the school was unique. He formed a link between the older ideals represented in Sir Robert Christison and the newer methods of separating the laboratory worker much more completely from the physician in charge of patients, and this change, though probably inevitable, is not without great drawbacks, for it eliminates much of the human element from the life-work of those who now guide the profession in therapeutic matters; and although this permits of a higher degree of specialisation, it certainly debars the worker from that close contact with the problems confronting the practising physician

which so often in former days opened up new lines of thought and action, and led to some of the most important advances in the region of therapeutics.

In Sir Thomas Fraser the two outlooks were harmoniously combined, with the result that he was not only respected as a research worker, but loved and trusted as a physician.