

**Diarmid Noël Paton.**

ON September 30th, 1928, the very day on which he had arranged to resign his position as Regius Professor of Physiology in the University of Glasgow, Noël Paton died suddenly. He had been in failing health for some months, but no one had anticipated so sudden an ending.

Diarmid Noël Paton, the eldest son of Sir J. Noël Paton, the famous artist, was born in Edinburgh in March 1859. He received his early education at Edinburgh Academy, where he had as classmates, W. Herdman (afterwards Professor of Zoology at Liverpool), D'Arcy Thompson (Professor of Zoology at St Andrews), and J. S. Haldane. Until he reached the age of thirteen his whole bent had been towards drawing and painting, but contact with the budding zoologists Herdman and Thompson gave a new turn to his interests. They formed a club called the Eureka Club, and spent their Saturdays hunting for fossils in the country round Edinburgh; later, inspired largely by White's *Natural History of Selborne*, they enlarged the field of their interests to include birds and butterflies. He was presented with his first microscope by his father in 1876, and subsequently during his summer holidays spent much of his time examining the fauna and flora, both of the salt and fresh water at Ardmay. Although art still strongly attracted him, he finally decided, in 1877, to go to the university to study science and medicine, a decision which was probably determined by Matthews Duncan as well as by his early associates.

In his science course the men who influenced him most were Tait, Isaac Balfour, and Crum Brown. In 1879 he began his first piece of research work on the morphological significance of the semeniferous bracts of larch cones and on the course of the fibro-vascular bundles in the young cones. In 1881 he graduated B.Sc., being awarded the Baxter Scholarship, and a year later M.B., C.M. with first-class honours.

As regards his purely medical studies, Noël Paton was deeply interested in physiology from the outset. Anatomy, which he studied under Turner and Symington, interested him less. Pathology, under Hamilton, and the physiological side of therapeutics, under Fraser, he thoroughly enjoyed; but the final-year subjects did not make much appeal.

In the autumn following his graduation in medicine Noël Paton

went to Vienna. It was the first time he had been abroad, and the new life, particularly the opera and the art galleries, made a great impression on him. He worked mainly at clinical subjects, dermatology, diseases of the eye, ear, and throat. In March 1883 he went to Strasburg to work with Schmiedeberg, but he missed the cosmopolitan life of Vienna and went on to Paris for a short time, where he again devoted most of his attention to dermatology. A little later he returned to Edinburgh to take up a house appointment in the Edinburgh Royal Infirmary under Brackenridge. Whilst a resident, he worked up a case of Jacksonian epilepsy in the wards, and this formed the matter of his first published paper.

In 1884 he was awarded the biological Fellowship in the physiological department of the University of Edinburgh under Rutherford, and began work on urea formation and bile secretion. This work he eventually expanded into a thesis which he lodged for the degree of M.D. He obtained this degree with first-class honours and was awarded a gold medal for his thesis. About this time he was offered an assistantship by Underhill, and he "put up his plate." He was also appointed physician to one of the city dispensaries and a clinical tutor at the Royal Infirmary. When, in 1886, the lectureship in physiology at Surgeon's Hall became vacant, Noël Paton was appointed, and two years later he succeeded Sims Woodhead as Superintendent of the Research Laboratory of the Royal College of Physicians, Edinburgh. He was now able to give up practice and devote his whole time to research work and teaching. He had opportunities at the College of Physicians laboratory, and he utilised to the full his chance. At that time the majority of the younger workers turned to this laboratory for encouragement, and this Noël Paton, ably seconded by Sir John Batty Tuke, then the Curator, freely gave. During his tenure of office the output from the laboratory, both by the superintendent himself alone or in collaboration and by the other workers, in all fields of medical research, was unequalled in Britain, as is clearly manifest by the volumes of the laboratory reports. The subjects to which Noël Paton devoted his attention at this time lay mainly in the field of chemical physiology—indeed one may say that he was the first physiologist in this country to devote serious study to the problems of metabolism. He published at this time many interesting papers ranging over a wide field. His work on urea and the end products of protein metabolism, on hepatic glycogenesis, on the physiology of the carbohydrates, on the nature of muscular energy, and on hæmatological problems was both

interesting and critical. In 1898 there appeared a valuable report issued by the Fishery Board for Scotland on the "Life-History of the Salmon in Fresh Water," consisting of seventeen papers by Noël Paton and his collaborators in the Royal College of Physicians laboratory. The problem of dietaries always interested him. In 1900 he published the first of his studies on dietetic subjects, "The Diet of the Labouring Classes in Edinburgh," carried out under the auspices of the Town Council of the City of Edinburgh in conjunction with J. C. Dunlop and Miss Elsie Inglis. This was the first serious inquiry, along modern lines, into mass dietary questions in this country. He also, in 1903, published a report, through the India Office, on the nutritive value of certain "famine foodstuffs," and later, in 1905, a study of vegetarian diets.

In 1906 he was appointed to the Regius Chair of Physiology in the University of Glasgow on the resignation of Professor J. G. MacKendrick. He took over in Glasgow a new laboratory planned and built under the direction of MacKendrick but still awaiting equipment. Noël Paton devoted himself heart and soul to making his new laboratories as complete and up-to-date as possible. As soon as the equipment of the department was finished he showed the untiring energy, which characterised his Edinburgh days, in initiating and stimulating research work. His early work in Glasgow was mainly devoted to the study of endocrine function, a field in which he carried out much pioneer work. As the result of these studies he published, in 1913, an interesting and stimulating book on the *Nervous and Chemical Regulators of Metabolism*. This was followed by an intensive study of the function of the Parathyroid, or, as Noël Paton preferred to call them, the Parathyreoid glands. Whether his final conclusions be accepted or not, these investigations are most complete and thorough, and will always have to be reckoned with in any further study of these glands.

Concurrently with his endocrine studies Noël Paton directed a series of investigations on dietary problems, for the most part studies of the diet of the very poor, which culminated in the elaborate study, carried out in conjunction with Professor L. Findlay, on the relation of poverty, nutrition, and growth. The influence of overcrowding, underfeeding, and maternal care, or lack of care, was investigated in a way that had never before been attempted. The result of their investigation was to show that environment, in the broadest sense of the term, is less important than the human factor. They emphasised the large part played by maternal efficiency on the physical condition of the children. This report was published by the Medical Research Council. Noël Paton was always

interested in the relation of physiology to practical medical problems. Working in collaboration with Findlay and others he published a series of papers on the "Rickets" problem, in which the popular vitamin hypothesis was vigorously combated.

Noël Paton's interest in the factors involved in heredity had been aroused by his work on endocrine disorders, and had been further stimulated by his sociological investigations. He now took up this problem, and as a result published in 1926 *The Physiology of the Continuity of Life*, in which he attacked many of the accepted views. Noël Paton hated *ex cathedra* teaching, maintaining that so-called authoritative textbooks have always played a great part in hindering the advance of science. A motto he admired was "*Nullius addictus jurare in verba magistri.*" He tried to keep an open mind himself, and did not hesitate to ask his auditors or readers to make the necessary intellectual effort of judging the validity of the evidence he put before them.

The last work on which he was engaged was a re-examination of the factors involved in the adjustment of posture and postural apnoea in the duck and swan.

He published in all between eighty and ninety papers, as well as textbooks of physiology both for medical and veterinary students.

Euthusiastic as Noël Paton was as a research worker he was equally enthusiastic as a teacher. It may be said, without fear of contradiction, that he was one of the last "all-round" professors of physiology in this country. He was interested in physiology as a whole and he taught his subject as a whole. He was, moreover, really interested in teaching and was constantly endeavouring, up to the very last, to make his course well balanced, stimulating, and fresh. His endeavour was to interest his students in physiology, but he never forgot that the great majority of of them would eventually become ordinary practitioners of medicine. He never attempted to make them academic physiologists, but to instil into them, so far as he was able, physiological principles which would enable them to tackle, clearly and accurately, their clinical problems. He retained a vivid memory of his own difficulties in early days as a clinical tutor. He was an admirable expositor, clear, succinct, and thorough. Few, who saw them, will ever forget the excellent, and at times really masterly, blackboard sketches with which he illustrated his teaching. He loved to devise a diagram which would be illuminating and comprehensive and yet simple.

He found time to serve on many committees and boards. He was a member of the Royal Commission on Salmon Fisheries in 1900; of the

Food Committee (War) of the Royal Society, and took an active part in its proceedings; of the Committee on Agricultural Research of the Development Commission; of the Medical Research Council from 1918 to 1923. He was elected a Fellow of the Royal Society in 1914, and served on the Council from 1922 to 1924. He was elected a Fellow of the Royal Society of Edinburgh in 1886, served on the Council—1894-97, 1904-06, 1909-12, and was a Vice-President from 1918-21. He became a Fellow of the Royal College of Physicians, Edinburgh, in 1886. In 1919 he received the honorary degree of LL.D. from his Alma Mater, Edinburgh University.

As a man he was tall, alert, somewhat spare, and strikingly handsome in face. Beneath a rather formal, sometimes an aloof, manner, Noël Paton hid a very warm, sensitive, and kindly heart. He was strong in his likes and dislikes, and did not hesitate to put forward his views in a direct and uncompromising fashion. His own impatience of delay or of slowness of response or of uptake often, it is to be feared, defeated his own ends. And yet, despite this impatience and irritability, no one could be kinder if once his heart were reached. No case of real difficulty or hardship left Noël Paton unmoved. As a colleague he was ever anxious to do his share; he acknowledged freely help given by co-workers, and he was equally ready and willing to contribute from the wealth of his experience.

His interests outside physiology were keen although not catholic. He had a sound knowledge, general perhaps rather than particular, of both literature and art. His appreciation of outdoor life was acute, and he gained his real solace from nature rather than from men. Angling, in his later years, was his true relaxation. His enthusiasm for his beloved Tweed was infectious. Life held no greater joy for him than a day spent on its banks rod in hand. Wet or dry, with good basket or poor, he always enjoyed his beautiful stretch of water between Drumelzier Haugh and Burnfoot.

But at work and on holiday the problems of life and its mysteries were constantly with him. He lived for science. Science was to him more than mere joy; it was a religion whose teachings he accepted unflinchingly. His belief in and respect for the teachings of science ruled his life.

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