

Obituary.

JOHN IRVINE HUNTER, M.D.,

Professor of Anatomy in the University of Sydney, N.S.W.

THE death of the youthful professor of anatomy in the University of Sydney has inflicted upon medical science a loss the gravity of which it would be difficult to exaggerate. He was opening up new fields of investigation and suggesting new lines of advance which were certain to lead to results the extent and importance of which no one can estimate.

John Irvine Hunter was born at Bendigo in Victoria in 1898. When 8 years of age he developed pneumonia, and after his convalescence he was sent to recuperate at Albury, across the border in New South Wales. The aunt with whom he stayed at Albury decided to keep him there; hence his career was spent in the mother state of Australia. The bursary system of the Education Department in New South Wales made it possible for him to work his way from the State School at Albury to the Fort Street High School in Sydney (1912-14), and ultimately enabled him to enter upon the study of medicine at the University of Sydney in March, 1915. For several months after leaving school he passed through a phase of great anxiety. Without the means to enter the University, and being uncertain of securing a scholarship or bursary, he entered a business house in Sydney as an errand boy. But after six weeks of this experience he succeeded in winning a State bursary, which helped to defray the cost of his first year at the University. His most intimate friend during these years states that "his school course was undistinguished save for keen application, but even then he was recognized as a man of more than ordinary qualities." During his first year at Sydney University, without enough to get adequate food or time to spare for sport, he was also embarrassed by many other private difficulties. But the next two years gradually revealed the emergence of his distinctive abilities. He was earning an easy competence as a successful coach—usually in subjects one year ahead of the studies for his own examinations—and was winning scholarships and prizes. But besides having to earn the money for his own education he had to help to support his mother, who had made such great sacrifices for him during the first seven years of his life.

It was in 1917, when, after a life of singular difficulty and anxiety, he for the first time could contemplate the possibility of attaining the object of his ambitions, he conceived it to be his duty to run the risk of sacrificing everything. The Ministry of Defence had announced that medical students were expected to continue their studies and not go on military service. The Dean of the Faculty of Medicine was believed to favour the view that it was a mistake to deny medical students the opportunity of service open to other loyal men. The issue became a burning question in the University. Hunter decided that it was his duty to enter the army; but not wishing to embarrass those of his fellow students who had acted upon the Minister's instructions, he waited until the vacation and then, without telling

anyone, he went off and enlisted in the ranks. He went into a military camp and completed his training, and paid farewell visits to his relatives and intimate friends. On returning to the barracks he was amazed to find, instead of sailing orders for France and Belgium, an official notice ordering him to return to his studies. It is supposed that the dean of the medical school informed the Ministry of Defence that Hunter was a man of quite exceptional ability, who must at all costs be retained for the good of the medical school. Hunter's own hardships had developed in him an intense sympathy with the difficulties of others, and at one stage of his student career he even thought of abandoning the profession of medicine, for admission to which he had had to overcome such tremendous difficulties, and take up social service. Fortunately he consulted a very wise man, the Bishop of Albury, who had encouraged him in his early

struggles, and now advised Hunter to stick to medicine, as it afforded him a much wider scope for real social service than any lay position could give. Toward the end of his medical course he was again in doubt as to whether he should adopt the clinical or the academic mode of life, both of which keenly interested him. Professor J. T. Wilson, to whom he submitted his difficulties, urged him to adopt the work of a teacher and investigator, for which he had such exceptional aptitude.

During the last two years of his course he served as a demonstrator of anatomy and displayed a very keen interest in neurology, especially in the sympathetic system, which was destined to be the field of his greatest achievement. While yet an undergraduate he wrote an essay (awarded the Sandes Prize in Surgery) which he called "An Interpretation of Abdominal Pain," using clinical evidence collected by himself as the material for a penetrating and original analysis. When he graduated (with first-class honours and the University medal) in March, 1920, he was at once appointed senior demonstrator of anatomy. But Professor Wilson, realizing that, though there were urgent reasons why Hunter should immediately assume the responsibility

for teaching anatomy, some experience of clinical medicine and surgery is of vital importance to an anatomist, arranged with the hospital authorities to let Hunter act as a resident in the Royal Prince Alfred Hospital during vacations.

A couple of months after Hunter's graduation Professor Wilson was appointed to the chair of anatomy at Cambridge; and in July, 1920, Hunter became associate professor of anatomy at the age of 23 years. Before Professor Wilson left Australia at the end of the year he persuaded the University of Sydney to put the youthful professor in charge of the department of anatomy, and to agree to give him the opportunity to widen his experience by visiting medical schools in Europe and America. Hence, in August, 1920, he set out for England and he returned via America to Australia in February, 1922. Before he left Australia the burden of his heavy responsibility seems to have sat lightly on his shoulders, for in addition to the task of teaching and learning to administer a great department, he accomplished three important researches in utterly different fields of embryology, anthropology, and physiology.



PROFESSOR J. I. HUNTER, M.D.

He cleared up many of the difficulties in the interpretation of ovarian pregnancy, in the real significance of the occurrence of Neanderthaloid characters in aboriginal Australians, and in analysing the complicated factors of spinal shock following transverse section of the spinal cord. The first of these three noteworthy memoirs was published in the *Journal of Anatomy* in January, 1922. The special value of the case of primary ovarian pregnancy was due to the early period of development and the clearness of the evidence in demonstration of the fact that the ovum was fertilized as the closing coagulum was formed in the mouth of the Graafian follicle and proceeded to develop in the connective tissue in this situation, embedding itself *ab initio* outside the growing corpus luteum of pregnancy. The lucidity of the account of this specimen and the interpretation of its complexities afforded the first indication to the anatomical world at large that a new John Hunter had arisen.

The results of the experimental work that he carried out in collaboration with Mr. N. D. Royle between October, 1920, and July, 1921, were not published until this year ("The symptomatology of complete transverse lesions of the spinal cord," *Australian Journal of Experimental Biology and Medical Science*, vol. i, 1924, p. 57). By means of an ingeniously devised series of experiments he courageously attacked a difficult problem which had taxed the skill of many of the best experimental physiologists and clinical observers of Europe and America. In particular he addressed himself to the task of deciding whether or not vascular disturbances played a part in determining spinal shock. He showed that the variations in the ultimate results after section of the cord cannot be wholly explained by release of function alone. There may be combined with release of function (due to section of the conducting pathways), vascular changes leading to rapid degeneration, or a temporary stage of hyperexcitability of the nerve cells. The experience gained in this preliminary investigation was destined to prove of far-reaching importance when, in 1922, Hunter and Royle embarked upon the still more difficult task of cutting the Gordian knot of controversy regarding the sympathetic innervation of striated muscle and the central control of muscular tone. But before undertaking this work Hunter spent eighteen months in Great Britain, Europe, America, and New Zealand, getting into touch with the medical schools of the world. He went first to his former master, Professor Wilson, in Cambridge, who magnanimously allowed us at University College, London, to have the privilege of Hunter's stimulating help for a whole year. During that time he occupied the position of an honorary lecturer; and he taught and carried on research, gave addresses to various societies, studied clinical methods (especially neurology) in London, as well as in France, Holland, and Germany, and visited and made himself familiar with the methods of anatomical departments in most of the British and many of the Continental schools.

He carried out an important research upon the oculomotor nucleus of Tarsius (*Brain*, 1923), which, taken in combination with the results obtained by Brouwer, sheds important light upon the problems of human evolution. He made an intensive study of the fossil remains of men, and devoted particular attention to the Piltdown and Rhodesian remains in the British Museum. He devoted much time and energy to the problems involved in the reconstruction of the Piltdown skull, and showed that when the occipital region is properly reconstituted and orientated it presents a much closer analogy to the condition found in the newborn African anthropoids than does any other human skull. By demonstrating that there is no disharmony between skull and jaw he has eliminated the chief factor in the controversy that had been raging for ten years before his work was done. His monograph on the Piltdown problem, written in 1922, has not yet been published.

During the short time he spent with Dr. Ariens Kappers in Amsterdam he completed an investigation on the fore-brain of apteryx (*Koninklijke Akademie van Wetenschappen te Amsterdam*, 1924), for which he was awarded the M.D. degree of the University of Sydney and the University medal. On his way back to Australia he spent nearly three months visiting American and Canadian medical schools.

and not only acquired a knowledge of the scientific workers and their methods, but also rendered a great service by expounding in lectures and demonstrations the meaning of recent anatomical and neurological work in England. In particular he did a great deal toward making Dr. Henry Head's work on aphasia understood. On his return to Australia he was made full professor of anatomy, being given the Challis Chair which Professor Wilson had formerly occupied; and he set to work to introduce the far-reaching changes incidental to the restoration of histology to the department of anatomy. With the experience gained in his pilgrimage abroad he came to exercise an influence in the medical school and University; he was worshipped by the students and trusted implicitly by his colleagues.

But the heavy work which these things involved did not prevent him from embarking upon a new and most formidable task—the experimental investigation of the problems of muscular tone, the solution of which had hitherto defied the leading physiologists and neurologists. He attacked this intricate conundrum with confidence and courage. His experimental work upon the effects of section of the spinal cord gave him technical experience and practice in observing the effects of lesions of the nervous system; his association with Professor Kulchitsky at University College had given him an exact and certain knowledge of new facts relating to the sympathetic innervation of striated muscle which were of fundamental importance in the attempt to solve his problem; and his experience of the work at Queen Square, the researches of Dr. Henry Head, and Professor Stopford's work in Manchester, strengthened his assurance boldly to attack the problem. He had explored the field of neurology and acquired the wider vision; he had acquired the experience of solving his own problems and of seeing other people solve theirs; he was ready to defy armchair critics and boldly to attempt the solution of the enigma of muscle tone.

For several years Mr. Royle had been endeavouring to devise some means of alleviating spastic paraplegia. He had tried the usual surgical procedures on human patients, and by experiments on animals tried to discover some new operation, without much success. He put his difficulties before Hunter on the latter's return to Australia. Hunter showed him some of Kulchitsky's histological preparations, which revealed quite clearly that, contrary to the opinion expressed by Boeke and Aghdur, the sympathetic fibres to striated muscle did not go to the same muscle fibres as the medullated nerves. He suggested that they should cut the sympathetic supply to an animal's limb and study the result. They discovered that section of the sympathetic did not destroy tone, nor even necessarily reduce it. The change in tone was qualitative rather than quantitative. That aspect of tone which Sherrington calls "plastic" is the function of those muscle fibres innervated by the sympathetic; whereas "contractile tone" (as Langelan has called it) is a function of the voluntary and contractile fibres innervated by medullated somatic nerves, and is, therefore, not diminished by section of the sympathetic nerves. This fact is the principle that underlies the surgical operation which Hunter suggested (and of which he devised the technique) for the alleviation of those cases of spastic paraplegia due to an excess of plastic tone, but not for those in which the contractile tone alone is responsible for the spastic condition. In the hands of Royle this operation has yielded results which must seem incredible to those who have not witnessed them. It has placed in the hands of the surgeon a technique which is destined to relieve a considerable group of sufferers from spastic troubles not only of voluntary muscles, but also of visceral muscles, such as those of the stomach and intestine, the bladder, etc. But Hunter has extended the field of his experimental investigations and has studied the nature of the proprioceptive reflex arcs that are concerned with the maintenance of the two varieties of tone. Deiters's nucleus and the vestibulo-spinal tract form integral parts of the somatic arc regulating contractile tone; whereas the ponto-spinal tract (Collier and Farquhar Buzzard) is an essential part of the sympathetic proprioceptive arc regulating plastic tone. His investigations have also shed a new light upon the role of the frontal cortex, the corpus striatum, the red nucleus, the substantia nigra, and the cerebellum as influences affecting tone.

Hunter and Royle were invited to New York to deliver (October 20th) the John B. Murphy Oration on their work (see *Medicine, Surgery and Gynecology*, December, 1924), and they gave demonstrations in many of the great medical centres of the United States and Canada. Hunter then came to England to expound the results of his work and to meet those who criticize his results. By a tragic fate he was struck down in the very week when he had hoped to demonstrate to those best qualified to appreciate it the new vision of neuro-muscular function created by his genius and insight. He died on December 10th, at University College Hospital, of enteric fever contracted before his arrival in England. He was so absorbed in the mission that had brought him to England as to be unconscious of the gravity of the illness from which he was suffering. The last lecture he gave was delivered on December 5th, in the anatomy theatre in Cambridge, the department of the master who had played so large a part in guiding his life and shaping his aims.

To those who have come under the spell of his genius and learned the truth of the teaching for which he has given his life it must ever remain a duty and privilege to expound his work in the hope of convincing others of its truth and to extend its applications by experiment and clinical application. To his widow and the University of Sydney we extend our deepest sympathy on their irreparable loss.

G. E. S.

The funeral service was held on December 12th at St. Pancras Church. The large congregation included, besides the widow, Sir Arthur Keith, the Provost and the Secretary of University College, Professors J. T. Wilson, G. Elliot Smith, J. P. Hill, E. H. Starling, A. J. Clark, C. C. Choyce, T. R. Elliott, D. M. S. Watson, and Kulchitsky, Mr. T. P. Dunhill, the High Commissioner for Australia, and the Agent-General for New South Wales. The British Medical Association was represented by Dr. Alfred Cox, Medical Secretary.

The Services.

NO. 14 STATIONARY HOSPITAL.

The annual dinner of the 14th Stationary Hospital was held at the Trocadero Restaurant, London, on December 12th. Lieut.-Colonel J. R. Harper, C.B.E., took the chair, and proposed the toast of "The Hospital," to which Colonel J. S. Warrack responded. It is proposed to hold the next dinner on the second Friday in December, 1925.

Medical News.

DR. CHARLES MAYO will be the president of the Inter-State Post-Graduate Assembly which is to visit this country next June, and not his brother, Dr. William Mayo, as originally arranged. Other members of the party will be Dr. Franklin H. Martin, Director-General of the American College of Surgeons, Dr. Crile, and Dr. John B. Deaver. Writing to Mr. Philip Franklin, Dr. Mayo states that it will certainly be a big meeting and expresses the hope that it will do a great deal of good in promoting harmony between the medical professions of Great Britain and America, and that its influence will be far-reaching on the people who read and hear of it.

OWING to the illness of Dr. Chandler, the meeting of the Tuberculosis Society on December 19th was cancelled. At the next meeting, on January 16th, 1925, Dr. Anthony Feiling will speak on tuberculosis of the central nervous system.

GUY'S HOSPITAL was founded at the sole costs and charges of Thomas Guy on January 6th, 1725. In connexion with the bi-centenary a solemn service in commemoration of the founder and other benefactors of the hospital will be held in the Cathedral Church of St. Saviour, Southwark, on Tuesday, January 6th, 1925, at 12 noon. The Prince of Wales, president of the hospital, has signified his intention to be present.

THE Queen's University [Belfast] Club, London, will hold a dance in the Hotel Cecil on Thursday, January 15th, 1925, at 9 p.m. Price of tickets (to include buffet-supper): members 12s. 6d., members' guests—ladies 10s. 6d., men 11s. 6d. Application for tickets to be accompanied by remittance and addressed to the Honorary Treasurer, 17, Wimpole Street, W.1.

THE Fellowship of Medicine is arranging a series of general lectures at the Royal Society of Medicine, the first of which will be delivered by Sir Arbuthnot Lane, at 5.30 p.m. on January 20th, 1925, and deal with the treatment of fractures.

Beginning on January 12th the London Temperance Hospital, in association with certain special hospitals, will hold a two weeks' intensive course in the general and special departments of medicine and surgery. A course in cardiology has been arranged from January 12th to 23rd at the National Hospital for Diseases of the Heart (attendance limited to 16). The Royal Eye Hospital, Southwark, will hold a fortnight's course in ophthalmology from January 5th, and from January 5th to 31st there will be a course in the diagnosis and treatment of common diseases of the nervous system at the West End Hospital for Nervous Diseases. From January 6th to 31st Dr. Porter Phillips and Dr. Thomas Beaton will give a series of lecture demonstrations on psychological medicine at the Bethlem Royal Hospital. A course in urology will be held at St. Peter's Hospital from January 12th to February 7th. Copies of the syllabus of these courses may be obtained from the secretary to the Fellowship of Medicine, 1, Wimpole Street, W.1.

THE January class of instruction in fevers, under the Metropolitan Asylums Board, will be held on Mondays and Thursdays at the Eastern Hospital, North-Eastern Hospital, and Grove Hospital, on Tuesdays and Thursdays at the North-Western Hospital, on Tuesdays and Fridays at the Western Hospital and the South-Western Hospital, and on Wednesdays and Fridays at the Park Hospital. The special course of instruction on the diagnosis and treatment of fevers will be held at the South-Eastern Hospital in February and March, on Tuesdays and Fridays, at 11 a.m., commencing February 3rd. A three months' course of lectures and demonstrations in hospital administration will be given at the North-Western Hospital on Mondays, Thursdays, and alternate Saturdays, beginning on January 5th. Full particulars may be obtained from the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C.4.

THE annual dinner of the Old Epsomian Club was held at the Trocadero Restaurant, London, on December 11th, with the President, Mr. G. E. Waugh, F.R.C.S., in the chair. Proposing the toast "Floreat Epsomia" in an interesting and witty speech, Mr. Waugh remarked that Epsom College was founded originally by a man of great individuality, who had taken an original line from the first in such matters as the teaching of natural science, and to-day it was proud of the fact that its scholars developed pronounced individualities rather than passively conforming to type. Individuality was also the characteristic of the teaching staff, and this quality was of great value in the world to-day. The headmaster, Mr. A. C. Powell, responding to the toast, announced some striking successes attained in the intellectual sphere during the past year. The new nave of the chapel—an Old Epsomian war memorial—was now in full use. The cost of erection was £12,000, of which over £10,000 had already been raised; he appealed to Epsomians to make a special effort to raise the remaining sum required. He hoped that it might soon be possible for more Old Epsomians to be elected to the Council. The college was the school of the medical profession, and had done a great work in training medical practitioners. Besides fifty boys, the sons of doctors, educated year by year without charge, a sum of no less than £5,000 had been awarded last July by the school in the form of scholarships, etc. The toast of "The Guests" was proposed by Mr. S. Maynard Smith, C.B., F.R.C.S. The Right Hon. Sir Hamar Greenwood, Bt., K.C., M.P., in his reply, described the medical profession as the highest instrument for good the world had ever seen: it recognized no frontiers of creed, colour, or race. Quality rather than quantity was the most vital need for the future welfare of the British Empire, and, therefore, he was particularly glad to be present that night and to extend to the college his congratulations on its past and his warmest wishes for its future. During the evening the school song, "*Canticum Epsomiense*," was sung enthusiastically.

THE annual dinner of the British Dental Hospital (formerly British Dentists' Hospital) was held at the Langham Hotel on December 6th, the President (Sir Harry Baldwin) in the chair. Dr. Lennane, in proposing the toast of the hospital, said that it had now proved the value of its existence. Mr. George Thomson, in his reply, said that all the members of the staff were also members of the British Dental Association. Mr. E. E. Turner proposed the health of the guests, which was replied to by Drs. Fenton, Duffield, Hewat, and Caley, and Mr. C. E. Wallis.

THE Minister of Health (the Right Hon. Neville Chamberlain, M.P.) has appointed Captain William Brass, M.P., to be his parliamentary private secretary (unpaid).

THE Rockefeller Institute for Medical Research has announced the release of the drug known as trypanosomiasis (African sleeping sickness and mal de Caderas) and selected cases of syphilis of the central nervous system. This action is based on results reported from clinical investigations which have been in progress for several years. The