THE FOUR APOSTLES OF SURGERY: AN HISTORICAL SKETCH.

*Being the Address at the Annual Meeting of the Glasgow and West of Scotland Branch of the British Medical Association.**

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FROM the time of Paré, there was much activity in the medical world down to the eighteenth century; but it was in a measure without system and cohesion. Many labourers had striven to perfect special portions of the machinery; but a combining master mind was needed to give unity and consolidation to the whole. Such a man was John Hunter. In him was found that "transcendent capacity for taking trouble", which we are told constitutes genius. An extraordinary devotion to details, with a wide and clear grasp of the whole bearing and teaching to be derived therefrom, were combined in him in a remarkable degree. Born, as you know, near this city in 1728, his origin was humble and his education scanty. It is impossible for me here to enter with any detail into a record of his career, though abundant materials exist in the biographies and numerous criticisms which have appeared on his life and writings; but it is requisite for my present theme to allude shortly to the remarkable influence he exercised on surgical science. Malgaigne well describes that influence when he said that, "in the Middle Ages surgery was only a trade, Paré and Petit made it an art, but Hunter raised it to the position of a science". He it was who allied anatomy, both human and comparative, physiology, and pathology, and welded them into one concrete system, and established "principles" to guide future practice. With unequalled power, he took a grasp of the whole subject, and worked out its fundamental doctrines with unique enthusiasm. He traced out and reduced to law and order the manifestations of life in every grade of creation, and showed how true practice could alone be founded on such an attentive observation of nature's ways as he himself ever exercised. Her modes of acting are often difficult to unravel; but, with true scientific spirit, Hunter tried to seize "the idea which lay hidden beneath these shifting phenomena, and bind it in such fetters that it may increase the pleasure and profit of endless generations of men". From Hunter's teaching came that true spirit of investigation which has been so fruitful of good in later times. Unconsciously, men have been guided by the influence which his work created. To him, constant, arduous, and thorough work was a passion. He sacrificed sleep and pleasure, and even fortune (for he died poor, notwithstanding his lucrative practice) to accomplish his scientific projects. Fourteen thousand pathological specimens are said to have been studied and prepared by himself. His published works betray long years of thought, and it is known that Sir E. Home destroyed a whole cart-load of manuscripts; and yet all this was accomplished in a comparatively short life-time. Fergusson has well designated John Hunter's Museum as "the heart and soul of British surgery". He and his brother spent £170,000 on their collections; and it is through the parsimony of the Government of the day, as is now known, that we in Glasgow have inherited £100,000 worth of these unique accumulations. John is the only man who ever gave £500 for a single skeleton. His great operation for aneurism, which established a far-reaching principle, was the result of study and meditation, and not chance; and was founded on his trust in the development of the collateral circulation, the deposit and organisation of fibrine, and the action of the absorbents. It revolutionised the whole pathology and practice regarding blood-vessels. It is now well known how nearly his early experiments failed; and how, by a curious accident, he was led to erroneous views regarding the nature of venereal disease.

William Hunter established a great school of anatomy in England; John Hunter founded the modern school of comparative anatomy and surgery; and of the many countrymen of whom we have reason to be proud, in all departments of science, there are none more worthy of a nation's regard than these brothers, and none perhaps whose work was a greater gain to humanity.

John Hunter was a pupil of Cheselden and Pott, and the master and inspirer of Abernethy, Cline, Astley Cooper, Jenner, Blizard, Carlisle,

Macartney, Everard Home, and Physick; all good men and true, into whose labours we have entered. Hunter's influence will increase with time, as science advances and accurate knowledge extends. His immediate successors were placed too near him to estimate aright his great proportions. His life marks an important epoch in surgery. To us he has left an inestimable legacy, not merely in what he accomplished, but in the spirit and accuracy with which he worked.

Just before Hunter's time, anatomical schools were opened in London; but we may form a notion of how little progress was made in teaching, when we learn from him (as related by Chevalier) that he was instructed how to perform surgical operations on a dog—the only "subject" to be had. Bromfield's syllabus shows anatomy and surgery to have been taught in thirty-eight lectures; Nicol instructed his pupils in anatomy, physiology, pathology, and midwifery in thirty-nine; and Nourse, in 1748, taught "totam rem anatomicam complectens" in twenty-three. Antecedent and contemporary with Hunter, there were many very able practical surgeons in London. Cheselden was a great anatomist and operator. Pott was a most polished, amiable, and accomplished man, who, beyond doubt, was the greatest practical surgeon of the day, and stood unrivalled as a clinical teacher. His writings on injuries of the head, hernia, fractures and dislocations, spinal disease and fistula, are important and classical contributions to our literature. He did much to simplify and render less cruel the practice of surgery. In his earlier days, the actual cautery was prepared, as a matter of course, before every visit; but this, and many other such atrocities, he was able to do away with. Samuel Sharpe and Sir Caesar Hawkins were also good practical surgeons in the metropolis in Hunter's day; but they were merely men of experience like the rest, and lacked that scientific mind and mode of working which Hunter possessed.

Hunter's teaching was most fruitful of results in English surgery, especially as regards the surgery of the vascular system. The more exact knowledge of anatomy, and the improved physiological views which arose from his instruction, gave his pupils confidence to undertake operations not before thought of. In 1796, Abernethy tied the external iliac for aneurism, and shortly afterwards Sir Astley Cooper the common carotid and the subclavian in its third part, while Colley before long ligatured the latter vessel proximal to the scalenus. In 1812, Stevens delegated the internal iliac, and Gibson of America the common iliac; while the acme of boldness was reached, in 1817, when Sir A. Cooper put a ligature on the abdominal aorta; and Mott, the following year, tied the innominate artery. All these brilliant feats followed on Hunter's example. The pathology of the blood-vessels was, at the same time in England, greatly advanced by the labours of Jones, Lawrence, Travers, and Hodgson.

An accelerated progress has marked the last seventy-five years. Almost every department of surgery has benefited by the light reflected from the collateral branches of medical and other sciences. Our methods of investigation and means of securing accuracy have been enormously improved, and, in the multitude of "scopes", we have mechanical aids of high value. From the microscope, experimental physiology, physiological chemistry, and pathology, a flood of light has shone on almost every dark corner, and hygienic science has already begun to influence for good the entire community. In 1832, the Anatomy Act rendered legal the means of acquiring knowledge which, before then, could only be got with much risk and difficulty, and its effect on medical education has been good beyond expression.

Operative methods have been within this century vastly improved. Amputation by the various kinds of flap has been introduced and greatly perfected, but has, in not a few instances, given way to that excellent device of excision, which, having begun with White of Manchester as late as 1768, has now attained a first place in our means of removing disease. White, as is known, operated on the head of the humerus, and Park of Liverpool in 1781 on the knee, after having, by experiment on the lower animals, satisfied himself of its feasibility. The Moreaus extended the practice still further; and Dupuytren, by his excision of the lower and afterwards of the upper jaw, in 1812, showed how much could be done to save life even in the most desperate circumstances. Autoplastic operations have, since the beginning of this century, been greatly improved, as they are now founded on true anatomical and physiological principles. Orthopædic surgery, founded on the observations of Hunter and first practised by Delpach, has been perfected in this century. The surgery of the genito-urinary organs, especially as regards the management of calculous disorders and stricture, has been much advanced. Torsion, though described by Galen and used by Avicenna, was rendered serviceable by Amussat. Herniotomy, the radical cure of rupture, staphyloraphy, the treatment of aneurism by compression, galvano-puncture, and otherwise, have all been worked out. All mechanical appliances have been simplified and rendered more efficacious. The proper and legitimate use of caustic and the electro-

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cautery has been in a measure defined. Iodine, galvanism, electrolysis, drainage-tubes, pneumatic aspiration, the *écraseur*, are all additions which, in our day, have been made to the appliances of the surgeon. Ovariectomy, first performed in 1809 by McDowell in America, has now reached a perfection beyond any expectation; and the securing of early adhesion—that triumph of British surgery—has been rendered almost certain by modern dressings. The experiments of the early part of this century with catgut and silk-worm gut, tendon and metallic ligatures, to promote the healing of wounds, failed, but has now succeeded by more scientific employment. Of all the improvements or discoveries made, however, none can compare to anæsthetics and antiseptics, which have done more to diminish suffering and save human life than the united inventions of two thousand years. They, of themselves, will for ever render conspicuous this century in which we live. Finally, the thermometer promises to do as much for surgery as it has already achieved for medicine, and to materially increase our control over disease.

Before closing, it is requisite that I retrace the steps of my narrative somewhat to glance at the uprise of the great school of surgery in France, at the end of the last and beginning of this century, and which powerfully affected the history of our science. The old Academy of Surgery, founded, as was already said, in 1743, had done noble work in its day, and had concentrated and given its "imprimatur" to the labours of many distinguished men. Of these, J. L. Petit and Louis were perhaps the most celebrated. Petit did much for surgery; and, if nothing more noteworthy had come from his hands than perfecting the tourniquet, which he first described in 1718, his career would be an era in surgery. Up to his time, the best means for arresting bleeding during amputation was a mere band—the fillet or bleeding tape—tied firmly or twisted up by means of a stick; but when Petit provided the tourniquet, operators could, for the first time, leisurely arrange the coverings which were requisite for securing a good stump, and ligature the vessels which were divided. This was a great advance towards that early healing which was yet, however, far off, as Hunter had still to prove its innocency and advisability.

In 1793, the Academy became extinct. It had passed into its dotage and was effete. Then medical education in France was a mere farce. The "annus medicus" was reduced to three months, with lectures twice weekly.

At that time, a great clinical teacher appeared in Paris in the person of Desault, whose extraordinary practical talents exercised an influence on the whole profession in France, and stirred the dead bones with marvellous life. He left no writings whatever, but his teaching and example established a great school. It was in the many camps scattered over Europe that we have chiefly to seek for the surgery of the early part of this century, and there it was enthusiastically cultivated, but at a terrible cost, as no fewer than six hundred medical men perished in the French armies alone in eighteen months of that fearful war. To Percy and Larrey especially we owe many lessons of wide application, learned by them in the scenes of carnage which they were called on to witness. Forced by necessity to simplify every appliance, and dispense with all but the most essential apparatus, the military surgeons carried boldness in operation to the verge of temerity, and reduced their dressings to the most primitive simplicity. By them, "water-dressing" was chiefly introduced, or at least promoted. They came to employ it almost exclusively as a substitute for camphorated spirit and oil; and the "vulneraries", defensives, restrictives, etc., necessary to secure the digestion, mundification, carnification, and cicatrisation of wounds departed for ever. They eliminated setons and compresses and styptics from practice, and gave confidence in the use of the ligature, sutures, and incisions to secure drainage and relieve tension. It was on the battlefield, too, that amputation and excision were tested and improved, and the value of early operation fully recognised. The din of battle, however, was unable wholly to drown the voice of scientific discussion; and the teaching of Bichat did for the French school to some extent what Hunter accomplished for the world. Bichat died at thirty-one. He was little known at twenty-nine, and yet, before his death, he attained to undying renown. Extensive, accurate, and original works on physiology, anatomy, and pathology flowed from his pen; and he indoctrinated a host of men who, culminating in Dupuytren, made the French school famous.

Between 1814 and 1826, Boyer published the best work on general surgery which had appeared since Ambroise Paré, and many distinguished men in France wrought well to advance surgical science: Chopart, Pelletan, Sebatier, Deschamps, Dubois, Lombard, and Delaporte, all occupied prominent places in surgery; while Lavoisier reformed chemistry, and Laennec, working out the ideas of Avenbrugger and Corvisart, added auscultation and percussion to our means of investigation. Magendie, too, in France, contributed greatly by his

experimental physiology to extend and give accuracy to our knowledge. My time will not allow me to do more than refer to these and to Broussais, whose doctrines threatened at that epoch to overturn the received views on medical science, but he survived their acceptance.

There cannot be a doubt that Dupuytren, whose career as surgeon to the Hôtel Dieu extended from 1808 to 1835, was the leading foreign practical surgeon of this century. Selfish, austere, and self-reliant, he concentrated in himself the renown of the French school of surgery. Five hours daily he spent in the hospital wards, and at one time he conducted courses of lectures on three different subjects. He sacrificed his constitution to his ambition. The concours by which he seized the highest place from Roux and Marjolin, and which occupied the attention of the profession in France for forty days, is still an inspiring tradition of the French school. He is said to have left a fortune of seven million *francs*. He had an unsurpassed reputation, but hardly any contributions to surgical literature, except what were collected by his admiring pupils, remain to testify to his skill and learning. Contemporaneously with or subsequently to Dupuytren, there were many very distinguished surgeons in the French school: Roux, Marjolin, Riche-rand, Cloquet, Delpech, Lisfranc, Sanson, Lallemand in the earlier time; and after them, Velpeau, Malgaigne, Blandin, Nélaton, Laugier, Vidal de Cassis, Follin, Jarjavay, Jobert, Lenoir, Morel-Lavallée. I know that some of my audience remember with pride several of the older teachers I have mentioned; I, and many more, meet with gratitude on the information and guidance we received from the last-named group.

In our own country, during later years, death has been busy in our ranks. In Liston, Syme, and Fergusson, practical surgery had representatives who have never been excelled in any age or country, and it is with just pride that Scotland claims them as her sons. I may be allowed to pay my personal homage to the memory of Sir William Fergusson, who honoured me with his friendship during my whole professional life, and for whose scientific and personal acquirements I had the deepest respect. He was beyond question the greatest practical surgeon of our time, and united, in indissoluble bonds, the "science" and the "art" of surgery. Brodie, Lawrence, Travers, Crampton, Colles, Cusack, and many more have helped to exalt the prestige of our art and the reputation of British surgery. My time will not permit any reference to the labours of these later contributors to surgical science, and it would be invidious to speak of the work of those who still remain among us; though I may venture to say there still exist in Germany, France, and Great Britain men as highly endowed, and as able to advance the cause we all have at heart, as have appeared at any former period of history. We live in the age of "conservative" surgery, when it is the aim and ambition of surgeons to preserve and not to mutilate; and that desirable end is to be secured by following the path which Hunter defined: to watch Nature, and to act in accordance with her dictates. The rapid communication which has been of late years established throughout the world places all the members of our profession *en rapport*, and so allows them to work together for the one great end: the good of their fellow-men.

I end my task with the humiliating reflection that, from lack of time and knowledge, I have omitted much that, in such a review, demanded record; but I submit it to you as an endeavour to trace the path by which our profession has travelled and the chief pioneers who have directed its advance.

We are the true ancients, and, though we are but in the morning of the times, we have already succeeded to a great inheritance won by the toil of a long line of noble men. Much still remains to be accomplished; for truly we cannot say, with Alexander: "Our fathers have left us nothing to do." Each of us, even the most humble, has the power so to employ the talent committed to him, and so to exercise the skill to which he may have attained, as that no loss may accrue to that grand art whose boast it is to have "lessened age after age the stripes wherewith humanity is stricken". So I would conclude, in the words of Cicero: "Licet omnibus, licet etiam mihi, dignitatem medicæ artis tueri."

ST. ANDREW'S.—The deaths were 127 in 1876, against 169 in 1875; the death-rate for the former year being only 14.78, against 19.56 per 1,000 in the latter year. There were 39 deaths under five years of age, or 30.7 per cent. of the whole number; and there were as many as 12 deaths above ninety, and 1 over one hundred years of age. There were 10 deaths from whooping-cough, 14 from phthisis, 13 from cardiac disease, 15 from disease of the brain, and only 15 from pneumonia and bronchitis. There was not any death from small-pox, and but 2 from scarlatina. Dr. Archibald, however, reminds the commissioners of police, as the local authority, of the duty of providing a hospital for the reception of cases of infectious disease.