

# **The anatomical and pathological preparations of Dr. William Hunter in the Hunterian Museum, University of Glasgow.**

## **Contributors**

Teacher, John H. 1869-1930.  
Royal College of Surgeons of England

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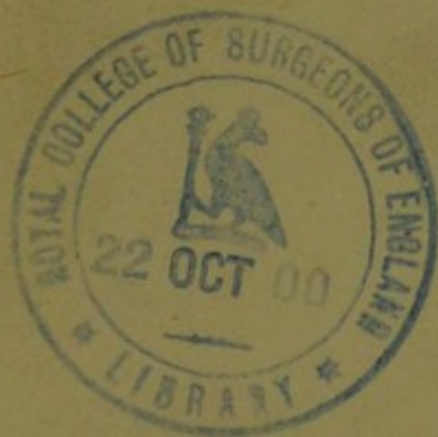
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The  
Anatomical and Pathological  
Preparations of  
Dr. William Hunter

In the Hunterian Museum, University of Glasgow

Reprinted from the Catalogue prepared by

JOHN H. TEACHER, M.A., M.B., C.M.



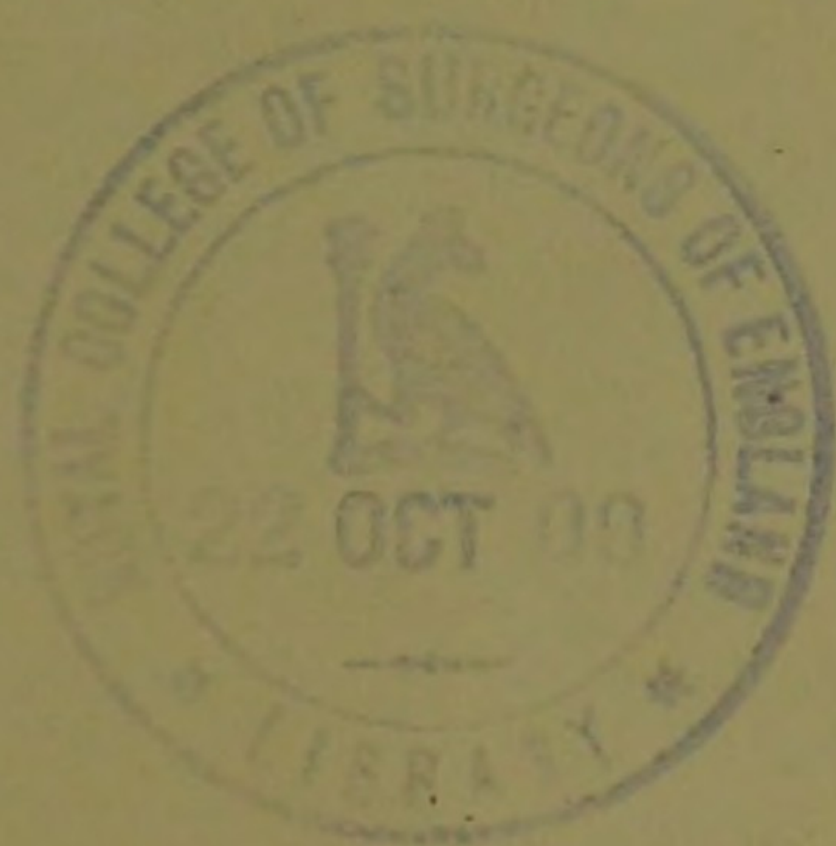
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1900



*With the Author's Compliments.*









THE PUBLISHER.

ADAM FULTON.

*William Hunter.*

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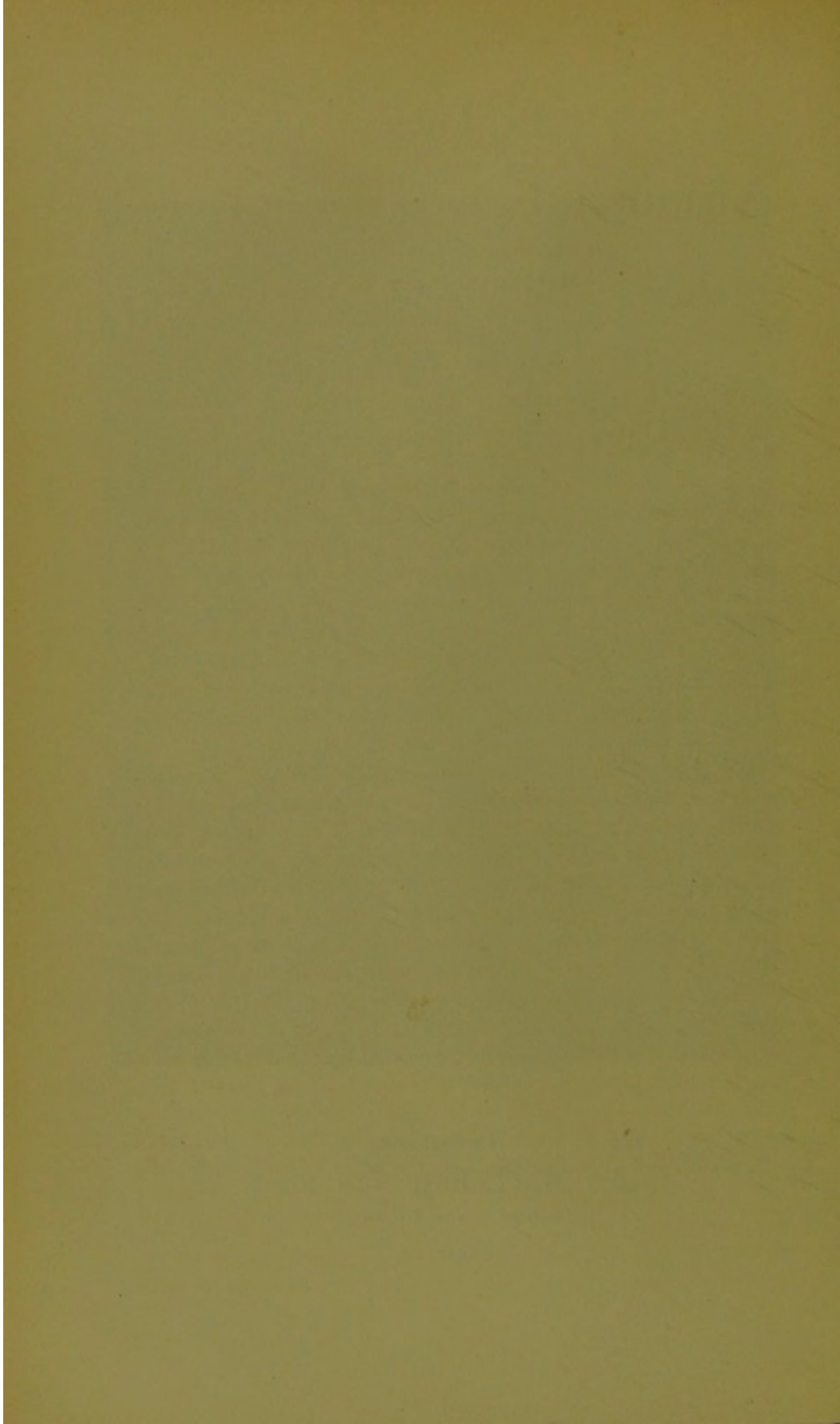
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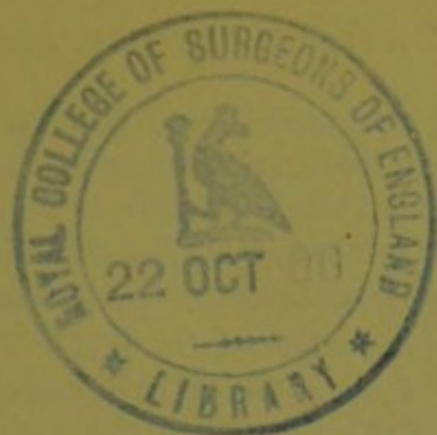


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## INTRODUCTION.

A CATALOGUE of that part of the Museum of Dr. William Hunter, which more than any other was the work of his own hands, would be incomplete did it not contain some account of its origin and growth, of the purposes for which it was used by its maker, and of the circumstances under which it came into the possession of the University of Glasgow. The intrinsic value and interest of the collection are very great, and it is, moreover, of very high interest historically from the fame of its founder, and its relationship to one of the greatest movements in the history of the medical profession in England.

The fame of William Hunter is firmly established, yet it has not always been rightly appreciated on what that fame rests. The tendency has been to remember only one side of his work. William Hunter is generally known in the medical profession as an obstetrician. According to the late Dr. Matthews Duncan, he "certainly was one of the greatest that has ever flourished in this country or in any other." He was celebrated as a teacher of midwifery and a reformer of the practice of midwifery, and his name has been kept "constantly before the profession as the founder of the science of obstetrics" by his great work, *The Anatomy of the Human Gravid Uterus, Exhibited in Figures*. That he has other claims upon the admiration and gratitude of posterity has not been so well remembered. His scientific work was in reality almost entirely on anatomical lines even in obstetrics. As Dr. Matthews Duncan has well said, "We know from his own mouth that it was as an anatomist that he claimed eminence and expected fame; and although his reputation has latterly become too exclusively obstetrical, it has not even in this respect been too highly exalted. Yet it is necessary, with a view to justice, to point out that his



obstetrical fame is chiefly anatomical, and that his greatest claim on our admiration and gratitude arises from his anatomical work and influence."<sup>1</sup>

Of William Hunter's printed works undoubtedly the most important is the one already alluded to. It embodies his greatest discoveries; it has been characterized by Waldeyer,<sup>2</sup> so lately as 1886, as containing "the foundations of our present knowledge of the anatomical relations of the membranes and the gravid uterus"; it is still the foremost work of its kind in this department of anatomy; compared with it his other works are of minor consequence, yet they make contributions to anatomy, physiology, and pathology, as well as to the practice of medicine and surgery that would of themselves have given him a very considerable reputation. Further, he was the founder, the organizer, in every way the leading figure of the school of anatomy of which Sir Charles Bell wrote in 1812,<sup>3</sup> the school "founded by the Hunters has made all the anatomists of the present day at home and abroad." It was through this school of anatomy even more than through his writings that his great influence made itself felt.

In 1828, the condition of anatomy in Britain at that time and previously, especially as to the difficulty—"whether arising out of the state of the law or an adverse feeling on the part of the people"—of obtaining subjects for dissection, the manner in which they were obtained, and "the evil consequences thence ensuing as well to the sciences of medicine and surgery as to all who study, teach, and practise them, and eventually to the members of the whole community," was the subject of an enquiry by a select committee of the House of Commons;<sup>4</sup> and the evidence taken by that committee and the report which they issued are the most reliable sources of information regarding these matters.

The importance of anatomy and the principle that the government of this country ought to protect anatomists and supply materials for the teaching of it, were recognized by a statute of Henry VIII.; but long before the beginning of the eighteenth century the provisions

<sup>1</sup> Harveian Oration, by Dr. Matthews Duncan, *Edinburgh Medical Journal*, No. cclii., June, 1876, p. 1070.

<sup>2</sup> *Biographisches Lexikon der Aertzte*, Gurlt and Hirsch, Vienna and Leipzig, 1886, s.v. William Hunter.

<sup>3</sup> *Letters of Sir Charles Bell*, p. 197, 8vo, London, 1870.

<sup>4</sup> Report from the Select Committee on Anatomy, 1828, printed for the House of Commons.



of that statute, though slightly amplified by Acts of Elizabeth and James I., had become wholly insufficient owing to the progress of the science. These statutes granted to certain medical corporations for dissection a few bodies of criminals who had been executed, and gave protection to the demonstrations which were given upon these bodies to the members of the corporations and their apprentices. But these "public anatomies" were not sufficient for those members of the profession who properly appreciated the value of anatomical knowledge and desired to improve it, and consequently "private anatomies" were held, the material for which had to be obtained by the anatomist as best he could. The "private anatomies" at first were objected to by the corporations, who were jealous of any infringement of their legal rights; but gradually they came to be tolerated, and early in the eighteenth century had developed into somewhat imperfect courses of public lectures by private teachers. How imperfect they were may be learnt from William Hunter's *Introductory Lectures*,<sup>1</sup> and from various other sources. The only course which Hunter attended in London, "which was by far the most reputable that was given here," was that of Dr. Frank Nicholls, who "professed to teach anatomy, physiology, and the general principles of pathology and midwifery in thirty-nine lectures"; and "Mr. Nourse of St. Bartholomew's embraced *totam rem anatomicam* in twenty-three lectures."<sup>2</sup> Nicholls used only two bodies in his course. Of dissection by the students there was hardly any, since the lecturers could with difficulty procure only as many bodies as were absolutely necessary for the public demonstrations of the principal and well-known parts of the body. "Hence it is that the students never learn the practical part, and therefore never become anatomists; and the teachers themselves can hardly make improvements, because they cannot have subjects for private experiments and enquiries."

On the continent the position of anatomy was far better, as bodies for dissection were legally provided; and the facilities which English students found abroad, and the great advances which they saw had been made in consequence thereof, had also stimulated the

<sup>1</sup> "*Introductory Lectures*, delivered by Dr. William Hunter, to his last Course of Anatomical Lectures, at his Theatre in Windmill Street: as they were left corrected for the press by himself." Published by his Trustees. London, 4to, 1784.

<sup>2</sup> Ottley's *Life of John Hunter*, p. 4, Palmer's Edition of *Hunter's Works*, vol. i., London, 8vo, 1835.



taste for anatomy and the desire for better opportunities of prosecuting it at home.

To quote the report of the Select Committee,<sup>1</sup> "The reformation of this antiquated and imperfect system took place, in this country, in the year 1746, when Dr. William Hunter, having a singular enthusiasm for the science, established complete courses of anatomical lectures, and opened a regular school for dissection. The reform thus introduced was complete, and its author exulted before his death in having raised and diffused such a spirit for dissection that he should leave behind him many better anatomists than himself." Hunter's course extended over four months, and consisted of about a hundred meetings. "Some people," he said in 1783, "thought even my former courses too long; why? they had been used to see a course of anatomy finished in thirty or forty lectures; and therefore imagined that, when it took up nearly four months, it must be unnecessarily minute and prolix. But let them reflect how imperfect such courses were; let them recollect that they never saw the human brain or nerves, nor the human lymphatic system, nor the gravid uterus and its contents; let them recollect that there were few parts of the body which they understood thoroughly after attending even repeated courses of this kind, and then they will see that there was great room for improvement, and own that an opportunity of attending a more complete course of anatomical lectures must be a national advantage."<sup>2</sup> However it may have been before, it is certain that Hunter now managed to provide ample material for the practice of dissection by his students.<sup>3</sup>

The immediate consequences of this reformation of the teaching of anatomy were vast improvements in all branches of medical science and practice and the creation of such an enthusiasm for practical anatomy, and of such an appreciation of its value, that it came to be recognized by the authorities entrusted with the conferring of diplomas as an indispensable part of medical education, and to be practised on such a scale by "his immediate pupils and their successors" that Government was forced to legislate further for its regulation and protection. The Anatomy Act of 1832, which followed the report of the Select Committee, and under which, with but little modification, anatomists now work, may be fairly regarded

<sup>1</sup> Report from the Select Committee on Anatomy: *vide ante*.

<sup>2</sup> *Introd. Lectures*, p. 100.

<sup>3</sup> In 1756 William Hunter had about 100 students (*Supplement to Medical Commentaries*, p. 20). How many he had later is not known.



as the result in a great measure of Hunter's devotion to the science and singular success in teaching it, and infusing his pupils with his own ardour for it. In a work of Dr. Matthew Baillie,<sup>1</sup> which is quoted with approval in the evidence taken by the Committee, it is written that "if anatomy be more generally or more perfectly known; if surgery has received any improvements from it, it is to be attributed in a great measure to the spirit of this single man": and Baillie did no more than voice the general feeling of men of science in his day.<sup>2</sup>

It was in connection with his school of anatomy that the museum which William Hunter bequeathed to Glasgow University originated. William Hunter's connection with Glasgow was a close one. His father was the proprietor and tenant of the farm of Long Calderwood, near East Kilbride (about eight miles by road from Glasgow Cross), and his mother was the daughter of Mr. John Paul, the treasurer of the city of Glasgow. William, their seventh child, was born at Long Calderwood on the 23rd of May, 1718. At the age of thirteen and a half he became a student in the Faculty of Arts in Glasgow University, obtained a bursary, and studied for five years. "His father had designed him for the Church, but the idea of subscribing to articles of faith was so repugnant to the liberal mode of thinking that he had already adopted, that he felt an insuperable aversion to theological pursuits. In this state of mind he happened

<sup>1</sup> *Lectures and Observations on Medicine*, 8vo, London, 1825, p. 71.

<sup>2</sup> America is also particularly indebted to William Hunter, as is shown by the following extract from a letter which is preserved in the Museum. It is addressed to Dr. Hunter, physician-extraordinary to Her Majesty, London, by W. Shippen, Jun., from Philadelphia, under date Nov. 5th, 1765:—"I am much pleased to hear you still continue to bless mankind by your very entertaining and improving lectures; to them I am indebted for the small attainments I have made in anatomy, and the credit I gain in that way in the American world; am now preparing for my fourth course of anatomy, Dr. Morgan for his first course of materia medica. We have introduced the study of [word torn away] into our college, and hope every day to see our plan extended, and who knows but it may be even a college of physic? Such a hope would raise the jealousy of some teachers of medicine in Brittain (*sic*), but I know your benevolent heart too well to doubt of your being pleased to hear that divine science was cultivated in this and every part of the world. I am sure, too, you will be particularly pleased to know that your own sons are engaged in the glorious attempt in America; may the genius of Hunter be ever with us to ensure success." William Shippen was one of the founders of the University of Pennsylvania; his course of anatomy was the first ever given in Philadelphia.



to become acquainted with Dr. Cullen, the present [1783] celebrated professor at Edinburgh, who was then [1736] just established in practice at Hamilton, under the patronage of the Duke of Hamilton. Dr. Cullen's conversation soon determined him to lay aside all thoughts of the Church and devote himself to the profession of physic."<sup>1</sup>

In 1737 he went to reside with Cullen at Hamilton, to assist him in his practice, more probably as apprentice than as partner, since Cullen was considerably his senior, and had already been qualified, as qualification went then, for several years before he started practice there.<sup>2</sup> With him Hunter spent three years, which he afterwards described as the happiest in his life, commencing his medical education in what was then the usual way. In November, 1740, with a view to completing his education, he proceeded to Edinburgh, where, besides other studies, he attended the anatomy course of the first Alexander Monro; and in the summer of 1741 went on by sea to London, provided with letters of introduction to a number of Scotsmen settled there, among whom were Smellie and James Douglas. At that time there was certainly an understanding that he should return to Hamilton and enter into partnership with Cullen,

<sup>1</sup> From *An Account of the Life and Writings of the Late William Hunter, M.D., etc.*, by Samuel Foart Simmons, M.D., F.R.S., p. 2. London, 8vo, 1783.

<sup>2</sup> The above statement requires explanation. Cullen, in point of fact, had no medical qualification till 1740. He attended Arts classes in the University of Glasgow, and served an apprenticeship to Mr. John Paisley, an active member of the Faculty of Physicians and Surgeons of Glasgow, in that city before the year 1729. Towards the end of that year he went to London, where, after an examination (held by what body is not known to the writer), he obtained an appointment as surgeon on a merchant ship during a voyage to the West Indies. About the beginning of 1732 he returned to Scotland, and practised near Shotts for two years. During the winter sessions of 1734-35 and 1735-36 he attended medical classes at the University of Edinburgh. In 1736 he settled in practice in Hamilton, putting himself thereby within the territorial jurisdiction of the Faculty of Physicians and Surgeons of Glasgow. In the same year he underwent a part of his examination for admission as a member of that Corporation, but it would appear that he did not submit himself for the remaining part. In September, 1740, he received the degree of Doctor of Medicine from the University of Glasgow, and in 1744 he presented his diploma as Doctor to the Faculty of Physicians and Surgeons, whereupon he was admitted as a "freeman member of the Faculty." He was elected *Praeses* of that Corporation in 1747, and was continued in that office during the following year. It is evident that the reason why he did not complete his examination in the Faculty was his intention to enter it as a physician by presentation of his University diploma, to obtain which he was doubtless then making preparations. Compare note 2 on p. xxvii.



Hunter to take up the surgical part of the work, while Cullen devoted himself to the medical part. But he very early abandoned that idea. For a few weeks he resided with Smellie, who had reached London about two years earlier, and then Dr. James Douglas took him into his family as tutor to his son, and "as an assistant in his dissection room and in the surgery."<sup>1</sup> Douglas became much attached to his clever young assistant, and his kind offers of help appear to have been the principal influence that turned Hunter from his earlier plans, and led him to seek a career in London. The change did not interfere with his friendship with Cullen, who, it seems probable, already had it in his own mind to seek a wider sphere for his energies in Glasgow, into which he moved in 1744. The correspondence published in Thomson's *Life of Cullen* shows how intimate this life-long friendship was, and the high regard they had for one another.<sup>2</sup>

James Douglas was one of the leading practitioners of midwifery in London, and one of the most accomplished anatomists of the day. He is alluded to in Freind's *History of Physick* as "the first who has given us any true idea of the peritoneum." His name is always associated with it as the first describer of "Douglas's pouch." When Hunter came to him he was engaged upon the preparation of an atlas of the anatomy of the bones, the copper plates for which, to the number of 68, were finished before his death. The work was never published; the plates and a volume of proofs are preserved in the Hunterian Museum. It would have been a valuable addition to the literature of osteology.

While with Douglas, Hunter was also studying surgery in St.

<sup>1</sup> The intimacy of Hunter's relations with Douglas and his family is shown in the letters published in Mr. Stephen Paget's recent *Life of John Hunter* (Masters of Medicine Series: London, 1897). Latterly he seems to have acted as a sort of guardian to the family. The last survivor of them died in 1755; *vide* Simmons, *op. cit.*, p. 8. Douglas's papers, drawings, and plates passed into Hunter's possession, and are preserved in the Hunterian Museum.

<sup>2</sup> *Life of Cullen*, by John Thomson, M.D., Edinburgh and London, 1832 and 1859, 2 vols., 8vo. Cullen may be regarded as the real founder of the Glasgow School of Medicine. The University of Glasgow had the power of conferring medical degrees long before Cullen's time, but the existence of the medical school as a teaching institution was little more than nominal till his appointment to the chair of medicine in 1747. *Vide Memorials of the Faculty of Physicians and Surgeons of Glasgow*, by Alex. Duncan, B.A., LL.D., Librarian to the Faculty, 1896; and the *University of Glasgow, Old and New*, by Professor Stewart, D.D., 1891.



George's Hospital under Dr. James Wilkie, and anatomy under Dr. Frank Nicholls. He also attended "a course of lectures on experimental philosophy by Dr. Desaguliers." "Of these means of improvement he did not fail to make a proper use. He soon became expert in dissection, and Dr. Douglas was at the expense of having several of his preparations engraved. But before many months had elapsed he had the misfortune to lose this excellent friend." "Dr. Douglas died on the first of April, 1742, in his 67th year, leaving a widow and two children." "This event, the probability of which his father had pointed out to him, does not seem to have retarded his progress. Such a loss, and at so critical a period, would probably have destroyed the hopes of a man of less abilities and industry than he possessed. But he seems by this time to have had a consciousness of the superiority of his talents, and he who feels himself equal to great things will not easily be dismayed."<sup>1</sup> He continued working as hard as ever, and in 1743 his first paper, "Of the Structure and Diseases of Articulating Cartilages, by William Hunter, Surgeon," appeared in the *Transactions of the Royal Society*.<sup>2</sup> The paper is a very interesting one, and was a solid contribution to the knowledge not only of the anatomy but also of the pathology of the joints; it and the fine series of preparations on which it was founded, show that already he was a competent anatomist and a skilful dissector and injector. In accordance with the last wishes of James Douglas, Hunter continued to live with the family and to act as tutor to the son, who was supposed to be studying medicine, and in 1743 accompanied him to Paris for further study. Young Douglas was very dissipated, and would do nothing, but Hunter himself made good use of his opportunities. An interesting memento of this tour—a manuscript in Hunter's writing—is preserved in the museum, it is entitled, "An Abstract of the most remarkable things in Mr. Ferrein's course of Anatomical Lectures, read in 1743-1744." Ferrein was anatomist in the Royal Academy of Sciences in Paris, and Professor of Medicine and Surgery in the Royal College of France.<sup>3</sup> According to the

<sup>1</sup> Simmons, *op. cit.*, p. 8.

<sup>2</sup> *Phil. Trans.*, vol. xliii., p. 514. The identical preparation showing the structure of the cartilages, which was figured, still survives. Some of the injected joints are very fine. They form part of series 2, Anatomy of the Joints.

<sup>3</sup> He was the author of many monographs on medical subjects, some of which are referred to in Hunter's notes of his lectures. His name remains in the "pyramids of Ferrein" in the kidney.



*Biographie Medicale*, "he is to be regarded as one of the greatest anatomists of last century." The notes begin with Lecture IV.—"Nov. 19th, N.S."—which was "Of Bones." The last which is dated was on 26th March, 1744, and there are several after that which are not dated. The course therefore lasted at least five months, and consisted of about one hundred lectures. William Hunter's attitude towards the lectures is decidedly critical. He had done work that entitled him to criticise. He has taken very full notes of many of the lectures, but a considerable number of them he dismisses with the remark that "they contained nothing new." He had reason to differ from his master in regard to the articular cartilages, and to judge by the papers he published within the next few years, he found many other points open to criticism and correction. Possibly, just as Smellie was disappointed with the French teaching of midwifery, so Hunter may have been disappointed with the French teaching of anatomy, considering the reputation of the anatomists, and the facilities which they enjoyed.

At the same time this course must have proved invaluable to him. It was infinitely superior to anything he could get at home. The advertisement of his lectures<sup>1</sup> mentions specially that "gentlemen may have the opportunity of learning the art of dissecting, during the whole winter season, in the same manner as at Paris."

Even before this trip to Paris it is certain that he aimed at becoming a teacher of anatomy. In a letter of September 17th, 1743, he writes of accepting a partnership in a practice of a certain Dr. Owen, son-in-law of Dr. John Douglas, who had "died about two months ago," "as the only way to settle in my darling London, to give lectures," and though he does not here specify what the subject of the lectures was to be, there is no doubt it was anatomy.<sup>2</sup> There is also a letter to Cullen in May, 1746, saying, "among many other things that take up my time at present, I labour most at a compendious system of anatomy and physiology, which will be necessary to be before me in the winter, should I at last enter upon my old scheme."<sup>3</sup>

The same year saw his ambition realized. In the same volume

<sup>1</sup> Quoted in *Two Great Scotsmen*, Glasgow, 1893, p. 33, by George R. Mather, M.D.; and in Paget's *John Hunter*, p. 24.

<sup>2</sup> Paget's *John Hunter*, p. 42. The letter is dated simply Sept. 17th. John Douglas was a brother of Hunter's friend, James Douglas. He died on June 25th, 1743. *Dict. of Nat. Biography*.

<sup>3</sup> Thomson's *Cullen*, vol. i., p. 22.



with M. Ferrein's lectures there is a set of "notes on a course of Chyrurgical operations performed before the Society of Navel (*sic*) Surgeons, by Sam Sharpe of Guy's Hospital, March, 1746," taken by Hunter. It seems not improbable that the attendance on this course, and the writing of the "compendious system of anatomy and physiology," were both undertaken with the probability of succeeding Sharpe in the post of lecturer. For in the following autumn, when Mr. Sharpe found himself so busy in practice that he could not continue the lectures, the Society asked William Hunter to take his place. According to Simmons, "he is said to have experienced much solicitude when he began to speak in public," but anyhow he proved so satisfactory to the members of the Society that they asked him to give in addition a course of anatomy lectures. These were equally successful. Thus started his career as a teacher of anatomy. Simmons<sup>1</sup> has well said that, "as he had it in contemplation to teach anatomy, his attention was directed principally to this object; and it deserves to be mentioned, as an additional mark of his prudence, that he did not precipitately engage in this attempt, but spent several years in acquiring such a degree of knowledge and such a collection of preparations as might ensure him success."

These anatomical preparations were the nucleus of his museum. Years after, when he was the most successful practitioner of midwifery in London, he extended the plan of his museum, and collected anything and everything that might add to its usefulness in the diffusion of knowledge and culture. The prudence with which he commenced it is equalled only by the boldness and at the same time the shrewdness with which he went ahead with his plans. The great value that the museum, the expenses of which were paid as he went along out of his professional income,<sup>2</sup> ultimately attained, proves that he possessed an uncommon degree of business capacity and enterprise.

The school at first was located in Covent Garden, then in Jermyn Street, and finally, in 1771, was removed to a building which he had erected specially for the purpose—the Great Windmill Street School of Anatomy. Up to the time of his starting to teach anatomy his

<sup>1</sup> *Op. cit.*, p. 10.

<sup>2</sup> This fact and the amount of these expenses on *one department* of the museum are well shown by Mr. George Macdonald, M.A., in the introduction to the *Stevenson Catalogue of Greek Coins in the Hunterian Collection*, p. xxii., Glasgow, 1899.



success in practice can hardly have been very great, for he told one of his pupils that the fees he received at the commencement of the course (some seventy guineas) "was a larger sum than he had ever been master of before"; but success was beginning, the tide had turned in his favour, and he took it at the flood. So far his inclinations and opportunities seem to have led him in the direction of becoming a surgeon, but soon after this a change appears. He was admitted a member of the Corporation of Surgeons in 1747. In 1748 he was appointed one of the "Surgeons-accoucheur" to the Middlesex Hospital,<sup>1</sup> and in 1749 to the British Lying-in Hospital, with the latter of which he was connected for many years. These appointments greatly assisted in bringing him forward in his profession, and also directed him rather towards midwifery and what is now called gynaecology, "in which he was recommended by several of the most eminent surgeons of that time, who respected his anatomical talents and wished to encourage him." Probably, too, he had picked up some of Douglas's midwifery practice. Besides the retirement of several of the leading obstetricians within the next few years opened up to him great opportunities in this line, and gave him enough to do without trying to cultivate surgery, in which there were many able men, such as Percival Pott, Caesar Hawkins, Sharpe, and Bromfield. According to Simmons, "he had always an aversion to surgery," and Matthew Baillie says "he very much disliked all operations which might give pain."<sup>2</sup> Yet his earlier papers show a strong surgical bent, and his lectures and the preparations in the collection show that he did a certain amount of gynaecological operating.

In 1750 he received the degree of Doctor of Medicine from Glasgow University.

In 1751 he was admitted to the membership of the Faculty of Physicians and Surgeons of Glasgow. The entry in the minute book is as follows: "4th March, 1751, the Faculty in full form ordain a diploma to be made out in favours of Doctor Hunter of London as an honorary member, and the same to be transmitted

<sup>1</sup>The authority for this statement is Simmons, *op. cit.*, p. 14. There is no mention of it in *Wilson's History of the Middlesex Hospital*, but that institution is pleased to regard him as a former member of its staff. "If this were so—and at the most he could not have held office for more than a few months—it would be gratifying to think that in his case, as in that of many others in after years, the Middlesex Hospital supplied the first step on the ladder of fame." *The Middlesex Hospital Journal*, vol. ii., No. 8, p. 90, 1898.

<sup>2</sup>*Op. cit.*, p. 75.



to him by the *Praeses* and Visitor." This was the second occasion on which the power of conferring honorary degrees was exercised by the Faculty ; it remained in abeyance for many years afterwards.

In 1756 he left the Corporation of Surgeons and joined the College of Physicians, for which he was fined by the former body. Soon he was recognized as the leading teacher of anatomy, pathologist, and practitioner of midwifery in London. In 1762 he was called to attend Queen Charlotte in her first confinement, and in 1764 he was made physician extraordinary to Her Majesty, an appointment which finally established his position as a physician and an accoucheur.<sup>1</sup>

In 1768 he was appointed by King George III. professor of anatomy to the Royal Academy, then newly founded, with his friend Sir Joshua Reynolds as president, "an office on which he conferred celebrity by the zeal and ability with which he discharged its difficult and onerous duties."<sup>2</sup> There are a few fragments of his lectures to the Academy in the museum.

Simmons remarks that "although by these incidents he was established in the practice of midwifery, it is well known that, in proportion as his reputation increased, his opinion was eagerly sought after in all cases where any light concerning the seat or nature of the disease could be expected from an intimate knowledge of anatomy." His practice became one of the largest ever known in London. It is a wonder that he had the time and energy for anything else.

The form of the anatomical collection was determined by Hunter's courses of anatomy, and the researches to which it was related. The researches account for the strength of particular series or departments of the collection; the extent of such a series as the *Anatomy of the Lymphatic System* or of the *Gravid Uterus*, for example, is only to be understood when its relations to his works are considered. On the other hand, every series bears the impress of having been designed for the purpose of teaching anatomy as the term was understood in Hunter's time, and every preparation illustrates some point to which he was wont to refer in his lectures.

Details as to the dates at which preparations were made, and by

<sup>1</sup> William Hunter's holograph account of his attendance upon Queen Charlotte is preserved in the Hunterian Museum. We have given a brief description of this in an article in the *Glasgow Medical Journal*, July, 1899, under the title of "William Hunter, Anatomist."

<sup>2</sup> Munk's *Roll of the Royal College of Physicians of England*, vol. i.



whose hands, are obtained from his own catalogue of the collection, and, in greater measure, from the works of himself and of others who contributed so largely to its upbuilding.

William Hunter possessed in a remarkable degree the power of inspiring others with his own enthusiasm, and of engaging able men to work under his direction. The work of these assistants he scrupulously and generously acknowledged in his writings.<sup>1</sup> It is indeed easier to tell what is the work of his assistants' hands than what is the work of his own.

Of the "competent stock of preparations" which William Hunter had before he commenced teaching, very few are traceable. Doubtless Douglas had some, and doubtless these passed into Hunter's hands along with the plates and papers. One or two of the dry bones, in fact, can be identified with the plates. A few preparations that belonged to Cheselden have also been recognized. (*Vide* Index of Names.) The preparations of the joints connected with Hunter's paper on the Articular Cartilages have already been referred to; they are the earliest preparations that can be definitely identified as the work of his own hands.

Although his collection of preparations would seem to have been a considerable one, even before he began to teach anatomy, its greatest growth took place after that event. Most of the preparations, of which the history can be traced, date from after 1746. This is quite what might be expected. Only after the establishment of the course of anatomy would he realize what was required for its illustration, and only then would he obtain a sufficient supply of bodies for the making of numerous preparations. Moreover, till success in practice came the means to meet the expense of forming a large museum were not forthcoming, and success in practice came along with the growth of his reputation as an anatomist and pathologist.

In 1743 he first realized the leading fact as to the nature of the connection between the mother and the foetus in the placenta; and before 1746 he had also arrived at his ideas of the anatomical relations of the lymphatics to the arteries and veins, principally from the result of injections. Altogether, there is abundant evidence

<sup>1</sup> *The Dictionary of National Biography* (Article, John Hunter) states, in reference to the dispute between him and John Hunter, that "there is no doubt that . . . he regarded discoveries made in his dissecting room as his own." It is a pity that so unkind and at the same time so inaccurate a statement should have got into a work which is apt to be accepted as authoritative.



from his writings and from Simmons' statements that in the five years before 1746 he was constantly engaged in dissection, injection, and experiment; laying, at the same time, the foundations of his power as an anatomist and of his museum. The art of injecting—filling the vessels, whether blood-vessels, lymphatics, or ducts, with some fluid which would bring them clearly into view, either as an experiment in itself or as a preliminary to dissection—was one of the principal methods by which the sciences of anatomy and physiology were then being advanced; the injection apparatus and fluids being to the anatomists of those days what the microtome and stains have been to the anatomists of the last thirty years. The art received considerable improvements at the hands of William Hunter. Most of the anatomical preparations in the collection are injected, and their beauty and fineness attest the excellence to which he had brought the art.

One can hardly speak of any period of Hunter's life as the years of his greatest activity either in research or in the formation of the museum. Research and collecting went on constantly from 1741 to 1783. The most important of his works were written between 1750 and 1774, but he left much unfinished, some of which was published after his death. Part of this dates from before 1774, but certainly a good deal of it was of later date.

The MS. catalogue of the anatomical and pathological preparations transmitted to Glasgow with the museum by his trustees, was written for the most part between 1778 and 1780, but this was only the last edition of the work, which had grown up along with the museum; earlier catalogues exist in the museum. The bulk of it is in the handwriting of an amanuensis, but in one of the copies there are numerous later additions interlined in William Hunter's writing. The latest date—the only one in the interlineations—is 1782. Clearly the museum work and the researches were continued, as were his lectures, on to the end of his life. He was only 64 when he died.

In 1748 there were two events that were of great moment to the museum. The one was a second tour on the Continent, which included a visit to Albinus, the famous Dutch anatomist, whose "admirable injections, as he [Hunter] afterwards told Dr. Cullen, inspired him with a strong emulation to excel in that elegant and curious branch of anatomy."<sup>1</sup> The other was the arrival in

<sup>1</sup> Simmons, *op. cit.*, p. 13.



London of John Hunter, a fortnight before the commencement of the autumn course. John Hunter was then twenty years old; he was quite untrained to any craft or profession, and therefore perhaps was all the better suited for an assistant. He attended the lectures and worked in the dissecting room under the eyes of his brother and of Mr. Symons, the assistant. "Mr. Symons, of Exeter, surgeon, attended my first course of lectures in 1746, and the following three courses, and likewise assisted me in the dissections."<sup>1</sup> In 1749 Mr. Symons left to start practice in Exeter, and John Hunter was promoted to his place. Already his brother had recognized his ability and value as an assistant. John took charge of obtaining and preparing the bodies, and doing the bulk of the dissections for the lectures, and the making of preparations. He also looked after the students in the dissecting room, and occasionally lectured when William happened to be engaged. William was thus able to reserve his energies for the lecturing, for his own particular researches, and for his practice, which was the financial backing of the school of anatomy and the museum. The expenses of these were borne solely by himself. In 1758 he proposed to take John into partnership, giving him a share of the profits, and John was to deliver part of the course, but the proposal was never carried out, whether from John's aversion to lecturing, or from his health failing about that time, is uncertain. Together they worked at various researches. William's published works and lectures abound in references to the assistance he received from his brother, of whose industry and abilities he was evidently very proud. He records that John helped him in most of the dissections connected with his great work on the *Gravid Uterus*, and most of the many researches in which John at this time engaged were either undertaken under William's direction, or independently but at his suggestion. Two of these researches were published at length for him by William in his *Medical Commentaries*, and several others are referred to in the same work. This was John's first appearance as an author. A great deal of the first part of John Hunter's *Natural History of the Human Teeth* also dates from this period, as most of the preparations figured in the plates attached to that work, and which still exist, are in William's museum.<sup>2</sup> Of

<sup>1</sup> *Medical Commentaries*, p. 8.

<sup>2</sup> *The Natural History of the Human Teeth*, part 1, appeared first in 1771. It forms part of vol. ii. of Palmer's edition of John Hunter's *Works*, London, 8vo, 1835.



course all preparations made by John during these years were made at William's expense, and remained his property.

From 1743 to 1756 William Hunter printed nothing. After 1756 come in rapid succession a number of short papers and one elaborate work of a very strange kind, entitled *Medical Commentaries*. The preceding thirteen years were very busy ones in the way of research, and many discoveries resulted, which were communicated as they were made to his class. He deemed it better that his students should get the benefit of the new knowledge at once than wait till he should have time to publish it. Naturally others who were engaged in similar work made the same discoveries, but they published them, in some cases certainly knowing that Hunter had taught them publicly for years, yet wilfully ignoring him. Thence arose fierce controversy as to priority of discovery. The full title of the work which contains Hunter's side of these disputes is—"Medical Commentaries, part 1, containing a plain and direct answer to Professor Monro, jun., interspersed with remarks on the structure, functions, and diseases of several parts of the human body."<sup>1</sup> The book abounds in references to dissections and experiments made during those years, with minute details as to the dates at which they were made, and it therefore throws a great deal of light on Hunter's occupations and the formation of certain parts of the anatomical museum. Unfortunately the history of the controversies is also detailed at great length, the anatomy being "interspersed" through it. Consequently the *Commentaries* are most wearisome reading. What is of value in them from the scientific point of view, apart from their historical interest, is buried in a vast dust heap of argument and abuse of his opponents. His opponents' writings are just as bad or worse. Fortunately no other of his works appears in like form. In justice to him it may be said that he had the right side in the quarrel; he proved his contention as to priority, and that his opponents should have recognized his work in their writings. Such appears to have been the feeling among his contemporaries.<sup>2</sup>

<sup>1</sup> *Medical Commentaries*, 4to, London, 1762. Supplement, 1764; second edition, 1787. The controversies were with the Monros of Edinburgh and Percival Pott. Vide *Observations, Anatomical and Physiological*, by Alexander Monro, jun., pamphlet, 8vo, Edin. 1758, and also the same author's *Treatise on the Brain*, and Pott's *Treatise on Ruptures*, second edition, London, 1763. Mr. S. Paget has given a fair account of the controversies in his *Life of John Hunter*, pp. 56 *et seq.* Hunter's *Commentaries*, it is well known, were revised for him by Smollet.

<sup>2</sup> "I believe, I may assert, that the sentiments of the great majority of men



The quarrel with the Monros became public in 1757, but the *Commentaries* did not appear till 1762. In the meantime he published a number of papers upon matters concerning which he had no quarrel with any one.

In 1754 he became a member of the *Society of Physicians*, the precursor of the *London Medical Society*. The members of the society were accustomed to meet for the discussion of cases, and the reading of papers which it was designed to publish afterwards. The papers were to be as far as possible narrations of facts and observations; "hypothetical disquisitions, points of controversy, numerous and needless quotations, in short, whatever has rather a tendency to show the parts and erudition of the writer than to advance medical knowledge, will be suppressed." The communications were made by the members, and were received also from friends of members all over the world. In 1756 the society published the first volume of its transactions under the title, *Medical Observations and Inquiries*. In all six volumes were issued, and most of William Hunter's short papers appeared in them. He seems to have been a leading member of the society, as a very large proportion of the communications were made through him, and the publications ceased after his death.<sup>1</sup> Frequently the papers were accompanied by preparations, anatomical or pathological, many of which were presented "to Dr. Hunter's most valuable and magnificent museum."<sup>2</sup> They came from all parts of the United Kingdom, and a few even from America. Several of the papers are classics in medical literature, and the preparations connected with them are proportionately interesting—*vide* Index of Names. William Hunter's contribution to the first volume of *Medical Observations and Inquiries*<sup>3</sup> is a very good account of the various kinds of aneurisms, their symptoms, pathology, and treatment. It also contains the first notice of one of his discoveries—the aneurismal varix and varicose aneurism, or arterio-venous aneurism,—the con-

of science were in favour of the former" (Hunter). Bostock's *Physiology*, third edition, London, 8vo, 1836, p. 610.

<sup>1</sup> Several of these papers of William Hunter were reprinted after his death in various works, but the only collected edition of them which I know of is one mentioned in the *Bibliographisches Lexikon der Aertzte*. A number of his papers from *Medical Observations and Inquiries* and *Philosophical Transactions* were translated into German and published in 1784-85 in two volumes, 8vo, by C. G. Kuhn, at Leipzig. I have not seen these volumes.—J.H.T.

<sup>2</sup> *Medical Observations and Inquiries*, vol. vi., p. 100.

<sup>3</sup> "The history of an aneurism of the aorta, with some remarks on aneurisms in general," *Medical Observations and Inquiries*, vol. i., p. 323.



ditions which result when a communication is established between an artery and an adjacent vein in consequence usually of a wound. Wounding the artery in blood-letting at the bend of the elbow was a not very uncommon accident, and cases of arterio-venous aneurism must have occurred from time to time, but the condition had quite escaped notice till William Hunter recognised its nature and described it. He gave a full account of its pathology and treatment in a second paper in 1761, and further notes in 1770.<sup>1</sup> Plaster of Paris casts were taken from several cases, but neither they nor any specimen of the aneurism are now in the museum. His account of the condition is clear, full, and accurate; it contains practically all that is known about it now. The series of ordinary aneurisms is a considerable one.

In 1757 he also wrote <sup>2</sup> an account of a case of extreme emphysema, due to injury of the lungs by broken ribs, successfully treated by minute punctures of the skin to let the air out, and to this was appended a long paper on the structure and diseases of the cellular membrane, as the connective tissues were then termed. It is a remarkable paper in several ways. It bears evidence of a great amount of experiment and wide observation. The most important points as to the connective tissues were the demonstration—(1) that they were not to be regarded as the inorganic basis of our organized and vascular solids (as Haller supposed), but they were in themselves active vascular tissues capable of increase and decay in every part; and (2) that the fat is lodged in cells or bags peculiar to itself, and not merely in the interstices of the tissues like the water of an anasarca, as was commonly supposed. The functions of the epidermis were described, and the sweat ducts were demonstrated in a set of preparations, which are still in the collection; two of these are identified with the figures which accompany the paper. It also dealt with the growth of new blood-vessels into fibrinous exudations; the treatment of abscesses and empyema, pointing out the necessity of early operative interference in many cases; further remarks on emphysema; cattle plague; and tumours of the ovary and broad ligament. He had a very fair knowledge of the natural history of ovarian and allied tumours, and of the signs, symptoms, and complications to which they give rise. He did not, as has been stated, advocate ovariectomy. That, he says, had been done by others, but he decidedly goes

<sup>1</sup> *Medical Observations and Inquiries*, vol. ii., p. 390, and vol. iv., p. 385.

<sup>2</sup> "The history of an emphysema," *Medical Observations and Inquiries*, vol. ii., p. 17.



against it, pointing out the difficulties and dangers on anatomical grounds that were bound to attend it, *e.g.*, the difficulty of knowing beforehand if there were adhesions. If operation were to be done, he advised the trocar and cannula, but he thought, from what he had seen both in the living and in the dead body, that "a patient will have the best chance of living longest under it [the disease] who does the least to get rid of it." His attitude towards the major operation, artificial anaesthesia being unknown and sepsis the rule after operations, was certainly a wise one.

There are, besides, in the same volume papers on necrosis of bone<sup>1</sup> and on the symphysis pubis.<sup>2</sup> All of these papers are represented in the museum by numerous preparations. The originals of the illustrations are for the most part readily identified. Nothing more by him appeared in *Medical Observations and Inquiries* till 1770.

There are many investigations referred to in the *Medical Commentaries* which have left their marks on the museum, but the most interesting were those on congenital hernia and the lymphatics. William Hunter had recognized the nature and origin of congenital hernia, and to demonstrate exactly how it was produced, he set John to work at an inquiry into the descent of the testicles in the foetus. This John carried out with the most complete success. His paper was illustrated by three plates taken from dissections, which now form a series of preparations among the most beautiful in William Hunter's museum. It was a first-rate piece of work.<sup>3</sup>

The most important part of the *Commentaries* is that which relates to the Lymphatic System. His own discoveries in this system William Hunter regarded, and was accustomed to describe, as the "greatest discovery, both in physiology and pathology, that anatomy has suggested since the discovery of the circulation." Very valuable his work certainly was, but he seems to have overestimated the extent to which he was a discoverer; he had been anticipated to a greater extent than he was inclined to allow, and part of his discovery turns out to be really an error. He claimed to have proved "that the lymphatic vessels are the

<sup>1</sup> "An account of a diseased tibia," *Medical Observations and Inquiries*, vol. ii., p. 303.

<sup>2</sup> "A singular case of separation of the ossa pubis," *ibid.*, p. 321.

<sup>3</sup> This paper and an account of some "experiments on absorption by veins" were reprinted in *Observations on some parts of the Animal Economy*, which was first issued in 1786, and forms vol. iv. of Palmer's edition of *John Hunter's Works*. London, 8vo, 1837.



absorbing vessels all over the body; that they are the same as the lacteals; that these altogether, with the thoracic duct, constitute one great and general system, dispersed through the whole body for absorption; that this system *only* does absorb, and not the veins; that it serves to take up and convey whatever is to make or to be mixed with the blood, from the skin, from the intestinal canal, and from all the internal cavities and surfaces whatever." This great work, he says, he effected with the help of his pupils, John Hunter, Hewson, and Cruikshank.<sup>1</sup> The lymphatic vessels were discovered long before Hunter's time, and the lacteals—the lymphatics of the intestines—were regarded as absorbent vessels rising from the internal surfaces of the intestines, and carrying the products of digestion into the blood by way of the thoracic duct. Absorption was also allowed to occur from all surfaces and cavities of the body, but it was supposed to be done by open orifices of certain veins, which were termed inhalent vessels. The similarity in structure of the lymphatics to the lacteals had been noted, and it had been suggested that they too were absorbents; but the generally accepted opinions as to the functions of these vessels and their relations to the blood-vessels were decidedly vague and unsatisfactory. Though it was allowed that some of them might have an independent origin like the lacteals, many of them were only continuations of certain fine branches of the arteries—exhalent vessels; and whereas some of them ran into the thoracic duct like the lacteals, others were the inhalent vessels and ended directly in the veins. William Hunter's account<sup>2</sup> of their anatomical relations was a very great improvement and was quite what is now believed. From his observations of the phenomena of injections he was convinced that the arteries and veins formed a closed system of tubes. Whereas it was commonly supposed that the lymphatics could be injected by injecting the arteries, he believed that the arteries terminated in the veins alone "by continuity of canal," and proved that it was only when some of these vessels burst (as commonly happened in injecting), and extravasation occurred into the interstices of the tissues, that the injection mass entered the lymphatics. Also, when a fluid such as mercury was injected into the connective tissues, it readily passed into the lymphatics, but not into the veins. On these anatomical grounds, and from the similarity of

<sup>1</sup> *Introductory Lectures*, pp. 58-61.    <sup>2</sup> *Medical Commentaries*, pp. 5-6 and 40.



the lymphatics to the lacteals, and from the fact, which he first explained, that the path by which morbid poisons absorbed from ulcers, abrasions, or tumours entered the blood was through the lymphatics (as was demonstrated by the red inflamed streaks following the course of these vessels and the involvement of the nearest lymphatic glands), he argued that they and the glands were a complete system in themselves distinct from the blood-vascular system, but supplementary to it, inasmuch as they returned all the lymph and everything else that they absorbed to the veins by way of the thoracic duct. The fluid (lymph) which moistened all the cavities of the body, and which formed what he called "the interstitial fluid" of the tissues, he believed to escape from the blood-vessels, not by exhalent orifices ("exhalent arteries") which nobody could demonstrate, but "as a transudation of the thinner parts of our fluids from their (the vessel walls) not being quite close in their texture"; transudation meaning practically filtration under pressure. So far he was substantially right; but the rest of the theory, viz. that the lymphatics were the only means by which absorption was performed, was wrong. Inhalent orifices of veins could not be demonstrated; "that the lymphatic veins are a system of absorbents has been proved; that the sanguiferous veins are furnished with inhalent branches for the same purpose has been supposed; but Nature would hardly form two systems for the same operation. Such a supposition is inconsistent with the simplicity, uniformity, and perfection of her works."<sup>1</sup> Such was his argument. To prove it John Hunter, at William's suggestion, performed some experiments on living animals, which proved that the lacteals did absorb from the intestines, and were supposed to prove that the veins did not. But the premises of these experiments were defective; the experiments themselves were not sufficiently exhaustive. That they were not absolutely conclusive William Hunter allowed. "If we except poisons, other matters absorbed into the body cannot be traced so as to say whether they are absorbed and conveyed into the mass of blood through the lymphatics or through the veins, as mercury or oil of turpentine. But if we take poisons which stimulate the passages [*e.g.*, "the venereal poison" or poison from a septic wound] through which they are conveyed into the body as they go along, and thus enable us to trace them, we shall find they are conveyed by the lymphatics,

<sup>1</sup> *Commentaries*, p. 96, footnote.



and it is natural to suppose that they are absorbed through the same passages as matters not poisonous."<sup>1</sup> How such substances as mercury could be absorbed into the blood-vessels against the supposed force which "strained" the lymph out of them was inconceivable to him. The phenomena of osmosis, if they do not explain it all, at least make it comprehensible, but they and the influence of the activity of the living cells were discoveries undreamt of till many years after Hunter. When, about 70 years later, his great theory was overturned, the old theory of exhalent arteries and inhalent veins, which no one could demonstrate, and the existence of which William Hunter declined to admit, was revived, only to be dropped again in due course. One of the greatest objections urged (by Monro) against the theory that the lymphatics were the only absorbents was that they did not exist in birds, reptiles, or fishes; and it then became necessary to demonstrate their existence in those orders of animals. This was accomplished in William Hunter's school of anatomy.

John's health broke down soon after he made his experiments on absorption, and he appears never to have made any more of importance, but he discovered the lymphatic vessels in birds and in a crocodile. In 1759 he had pneumonia, and after that he was threatened with consumption. Finally, in 1761, he went abroad with the army, and his connection with his brother's school and museum came to an end.

His place was taken by another of William's pupils, viz. William Hewson, a physiologist of great ability. Hewson at first was assistant, but after a time he was taken into partnership, receiving a share of the profits of the school, and giving a considerable number of the lectures.<sup>2</sup> Hewson continued the study of the lymphatics with great success. His papers, describing them in birds, reptiles, and fishes, were presented to the Royal Society by William Hunter in 1768 and 1769, and he received the Copley gold medal awarded to the person who, in the opinion of the president and council, had, within the year 1769, "contributed most to the advancement of science and useful knowledge." He also published

<sup>1</sup> MS. Lectures of William Hunter in the library of the Royal College of Surgeons of England, 42, c. 28, p. 104.

<sup>2</sup> In 1846 the Sydenham Society published a complete edition of Hewson's works, with a biographical introduction, under the editorship of George Gulliver, F.R.S. Information as to him is obtained principally from that volume and from Hunter's writings, and from the various biographies of the Hunters.



in 1774 a description of the distribution of the lymphatics in the human body more complete than had ever been given before. Nearly all the work connected with these papers was done in William Hunter's dissecting rooms. The papers were illustrated by a series of most beautiful injected preparations, which under the terms of the partnership became the property of William Hunter. Most of the beautiful preparations of the lymphatics in the turtle and fishes, which now form a large part of Series 12, *Anatomy of the Lymphatic System*, are undoubtedly the work of Hewson's hands. There is also in the museum a set of dissections of the organ of hearing in fish, which appears to have been made by Hewson. Hewson's partnership with William Hunter ended in 1771 in a quarrel, which seems to have been originated principally about the possession of preparations; at least no reason besides that is given in the biography included in Gulliver's edition of his works. All preparations made in the school were made at Hunter's expense, and, according to Hunter's view of their agreement, they were his property, whereas Hewson claimed that, as a partner in the school, he had the right to make preparations for himself, provided the interests of Dr. Hunter and the lectures did not suffer thereby. The quarrel was submitted to the arbitration of Benjamin Franklin, who was an intimate friend of both, and he decided in favour of Hunter. The partnership was dissolved soon afterwards, and Hewson started a school of his own, which succeeded so well that before the end of the first course he had "more than half the number of pupils that he and Dr. Hunter had when in partnership." He unfortunately fell a victim to a dissection wound in 1774, aged only 34.

"From the manner in which Dr. Hunter<sup>1</sup> and Mr. Hewson<sup>2</sup> wrote of each other, it is pleasing to suppose that they did not finally retain any acrimonious feeling from the disagreement which had led to their separation." After the settlement of the dispute Hunter handed over a number of preparations to Hewson, and possibly some of them came back among those that he bought when Hewson's collection, along with that of Magnus Falconar,<sup>3</sup> was sold in 1778; but most of Hewson's preparations now in the museum never left it.

<sup>1</sup> *Introductory Lectures*, p. 60.

<sup>2</sup> *On the Lymphatic System*, p. 166, in Gulliver's edition.

<sup>3</sup> Magnus Falconar was a very promising young anatomist, a pupil of Hewson, and his successor in his school. He was married to Hewson's sister. He most faithfully edited his friend's unpublished writings. He died of consumption at the age of 24. Several preparations in the Hunterian Museum were "bought at Falconar's sale."



The work of Hewson was for a time strangely neglected, but its great merits are now fully appreciated. In addition to his work on the lymphatic system he was one of the first to shed light upon the nature of the coagulation of the blood and that everlasting puzzle, the function of the spleen. He was also celebrated as a microscopist. He recognized the true shape of the human red corpuscle, and described the "central particle" of those of birds, reptiles, and fishes, which is now known as the nucleus. He discovered the white corpuscles of the blood and lymph, and noted their similarity. Most of the experiments still performed to demonstrate to students the characters of the red corpuscles, and many of those which show the composition of blood plasma were devised by Hewson. William Hunter's microscope is preserved in the museum. Its highest combination of lens and eyepiece is about equal in magnifying power to the ordinary low power combination supplied to students of histology nowadays (*e.g.*, ocular of 6 magnifying power with objective 18 mm.), but vastly inferior in efficiency. Probably Hewson's was very similar. That he should have discovered so much with it must fill us with wonder and admiration for his *visus eruditus*. His microscopic preparations are in the Royal College of Surgeons of England. Hewson's discoveries greatly helped to establish Hunter's theory that the lymphatics were the only absorbents.

After the retiral of Hewson, Hunter applied to the College of Glasgow for some one to succeed him, and William Cumberland Cruikshank, a student and a graduate of Glasgow University, was recommended. He arrived in London in 1771, and was appointed to the care of the museum, library, and dissecting-room. After a few years he was taken into a partnership which lasted till Hunter's death. Under their agreement all the preparations he made became the property of Hunter, just as in the case of Hewson. He continued the investigation of the lymphatic system. Hunter referred to him as follows<sup>1</sup>:—"And last of all, Mr. Cruikshank, whom I also bred to anatomy, and took into my house upon the same plan, with the opportunities which he has had in this place, and by being particularly attentive to the lymphatic system, at my desire, has traced the ramifications of that system in almost every part of the body; and from his dissections figures have been made, which, with what I had before, will enable us to publish (we hope in a little time) a full account of the whole system, illustrated by accurate engravings." When Hunter died the work was still unfinished, but Cruikshank

<sup>1</sup> *Introductory Lectures*, p. 61.



finished it; it is the work on which his reputation mainly rests.<sup>1</sup> In the introduction he says:—"In consequence of Dr. Hunter's death this business has now fallen on me. I should have had no small share in it if he had lived; for I had made almost all the preparations from which the drawings were made, and from which the description would then have been and now is taken." "In the present publication we have many reasons to regret the loss of Dr. Hunter. It has so happened that we shall be able to derive no advantage to it from his fortune, which has been otherwise disposed of. The work, from this circumstance, cannot appear at present with the number of plates it would have done had he lived to publish it himself. We have also sustained considerable loss in being deprived of his extreme accuracy, good taste, and unwearied perseverance." Nevertheless the work was at the time the most complete account of the lymphatics that had ever been published. It was the summing-up of all the work that William Hunter and Cruikshank did upon that system. "Almost all the injections from which the drawings were made are still preserved in Windmill Street;" and, of course, are now in Glasgow University. The wet ones are still in perfect preservation; the dried dissections injected with mercury, as such always do, have long since decayed and become useless.

In addition to the preparations of the lymphatics, Cruikshank made many contributions to the museum that are worth mentioning. His paper on the structure of the skin and on insensible perspiration<sup>2</sup> was illustrated by preparations which are almost all there. Further, those which form Series 47 have been identified with a series of experimental dissections on the subject of generation which "were made upon rabbits, at the expense of Dr. William Hunter, in 1778."<sup>3</sup>

Moreover, there are also three preparations which have a curious and interesting history. Dr. Robert Kennedy, in the course of his researches upon the regeneration of nerves,<sup>4</sup> identified one of them

<sup>1</sup> *The Anatomy of the Absorbing Vessels of the Human Body*. By William Cruikshank. London, 1786, 4to; 2nd edition, 1790. It was translated into French, German, and Italian.

<sup>2</sup> *Experiments on the Insensible Perspiration of the Human Body, showing its Affinity to Respiration*. 8vo. London, 1795. It had already appeared in imperfect form along with some other matters in 1778.

<sup>3</sup> *The Experiments on Generation* appeared in *Phil. Trans.* in 1797, vol. lxxxvii., p. 197.

<sup>4</sup> "On the Regeneration of Nerves," by Robert Kennedy, M.A., B.Sc., M.D., Glasgow, *Phil. Trans.*, vol. 188 (1897), p. 257.



with the illustration in Cruikshank's paper, "Experiments on the Nerves, particularly their Reproduction, and on the Spinal Marrow of Living Animals," published in *Philosophical Transactions* in 1794. The experiments, however, were communicated to the Royal Society in 1776, and this is Cruikshank's account of what happened:<sup>1</sup> "These experiments were made for another purpose, by which I discovered the independence of the heart's motion on its nerves, as well as the reunion after division, and the regeneration after loss of substance in the nerves themselves. I wrote a paper on this subject a long time since, which the late Mr. John Hunter, to whose memory and talents I am always proud to pay my tribute, presented to the Royal Society, but it was not then printed; I think Mr. Hunter gave me for a reason, that it controverted some of Haller's opinions, who was a particular friend of Sir John Pringle, then President of the Royal Society. Another gentleman has lately made experiments on the same subject, and has also presented them to the Royal Society. Upon hearing these read at the Society, Mr. Home,<sup>2</sup> with that intelligence of anatomical subjects that distinguishes his character, and the school he was bred in, remembered my experiments, though made nearly twenty years ago. The present President of the Royal Society, who, fortunately for mankind, prefers the promulgation of science to Haller or any other man, on being made acquainted with this circumstance, has caused the paper on these experiments to be printed in the *Philosophical Transactions* for 1794."

On Hunter's death it was found that Cruikshank was co-heir with Hunter's nephew, Matthew Baillie, to the use of the museum for thirty years. Thereafter, till his death in 1800, he was the senior member of the Great Windmill Street School of Anatomy.<sup>3</sup>

Besides those already mentioned, another member of the Hunterian school devoted particular attention to the lymphatic system—this was John Sheldon, F.R.S. He improved the methods of injecting the vessels, and began a description of them, of which only one part was published.<sup>4</sup> He was a pupil of William Hunter and Hewson. He was a devoted admirer of the latter, and was probably one of the

<sup>1</sup> Given in a footnote to the paper on *Insensible Perspiration*, p. 88.

<sup>2</sup> Sir Everard Home, John Hunter's brother-in-law.

<sup>3</sup> *Life of Cruikshank*, Pettigrew's *Medical Portrait Gallery*, vol. iii., and *Dict. of Nat. Biography*.

<sup>4</sup> *History of the Absorbent System*. London, 1784, 4to. *Vide Dict. of Nat. Biography* (article, John Sheldon).



pupils who left Hunter when they split. He returned to him "as assistant in anatomy after the death of Hewson." In 1777 he started a school of anatomy on his own account. He succeeded William Hunter as professor of anatomy in the Royal Academy in 1782.

But the best part of the anatomical museum is the obstetric collection. This comprises over four hundred preparations, anatomical and pathological, which represent all that is permanent of the material foundations of the works on which chiefly rests the fame of William Hunter, viz. "his immortal work, *The Anatomy of the Human Gravid Uterus exhibited in Figures*," which, in the words of the late Dr. Matthews Duncan, "is one of the stable foundations of the science and art of midwifery, and cannot fail, in all future ages, to be as valuable and useful as it is now," and the little incomplete volume, *Anatomical Description of the Human Gravid Uterus*, left unfinished, and published after his death by Matthew Baillie, which was intended for a systematic description of the parts figured in the greater work, and an exposition of the physiology of these structures. The merits of these works are universally acknowledged. They contain the foundations of our present knowledge of the anatomical relations of the gravid uterus, and of the anatomy of the decidua, placenta, and foetal membranes. In particular, the nature, origin, and anatomical relations of the decidua are here described and figured as well as they are now or can be. His discoveries in this part of the subject Matthews Duncan, about forty years ago, characterized as "all true and containing all the truth," a statement which, even now, requires hardly any qualification. He carried the knowledge of these structures up to a point beyond which no advance could be made until the advent of the new science of histology. That has added an infinity of details which were beyond the reach of the means of research at Hunter's command, but has found little to correct in the descriptions which he wrote 120 years ago. "The more this great work on the anatomy of the gravid uterus is studied, the more extraordinary and unparalleled will its accuracy be found in every particular."<sup>1</sup>

Most of the illustrations and descriptions in these works can still be verified by reference to the original preparations from which they

<sup>1</sup> *Researches in Obstetrics*. Edinburgh, 8vo, 1868, p. 223. The essays collected "after more or less of change" into this volume were published separately, for the most part in the *Edinburgh Medical Journal*, between 1855 and 1867.



were taken. Like all great works on scientific subjects, they were the fruit of many years of patient observation and experiment. In 1741 Hunter, as we have seen, became associated, first with Smellie, and then with James Douglas. These two share the credit of directing Hunter into this line of work. Smellie's obstetric works are on other lines than Hunter's, and are not less famous.<sup>1</sup> Douglas' researches on the anatomy of the gravid uterus never reached publication; among his plates in the Hunterian Museum there are several on this subject, which are of considerable merit, though not to be compared with Hunter's. The work begun under Douglas only reached publication in 1774—over thirty years later.

"Anatomy," he says, in the preface to the engravings, "has, at least, kept pace in improvement with other branches of natural knowledge. Many of the moderns, through much labour and patience, as well as ingenuity and judgment, have thrown considerable lights upon the structure and operations of the human body; and they have, particularly by engravings, made the study of that art, in which humanity is so much interested, both more easy and pleasant. Most of the principal parts of anatomy have, in this manner, been successfully illustrated. "One part, however, and that the most curious, and certainly not the least important of all, the pregnant womb, had not been treated by anatomists with proportionable success. Let it not, however, be objected to them that they neglected what in fact it was rarely in their power to cultivate. Few or none of the anatomists had met with a sufficient number of subjects, either for investigating or demonstrating the principal circumstances of utero-gestation in the human species. But let what cannot be praised in others be passed over in silence. With respect to the present undertaking, in the year 1751<sup>2</sup> the author met with the first favourable opportunity of examining, in the human species, what before he had been studying in brutes. A woman died suddenly when very near the

<sup>1</sup> *Vide Life of Dr. William Smellie*, by Professor John Glaister, M.D. Glasgow, 1894, 8vo. Also *Dr. Smellie and Dr. William Hunter*, by Professor John Young, M.D., Keeper of the Hunterian Museum, *Brit. Med. Jour.*, Aug. 29, 1896. The original drawings for Smellie's *Anatomical Tables* are preserved in the Hunterian Museum. They are in red chalk, and many of them signed J. Van Rymsdyk. How they came there is not known. They are beautifully executed.

<sup>2</sup> This is the date given in the preface; in the description of the first plate 1750 is the date given. The original sketches are also dated 1750, which, without doubt, is the correct date.



end of her pregnancy: the body was procured before any sensible putrefaction had begun; the season of the year was favourable to dissection; the injection of the blood-vessels proved successful; a very able painter in this way was found; every part was examined in the most public manner, and the truth thereby well authenticated." In the course of some months ten plates were finished, which he proposed to publish forthwith, but other material coming to hand he resolved to wait. "He foresaw that, in the course of some years, by diligence he might procure in this great city so many opportunities of studying the gravid uterus, as to be enabled to make up a tolerable system; and to exhibit, by figures, all the principal changes that happen in the nine months of uterogestation. Such is the work which at length is offered to the public. The execution of it has indeed taken up more time than what was at first expected, but it gives the author no small satisfaction to reflect that the delay of publication has contributed not a little to the value of the work."<sup>1</sup>

All the original drawings used in the atlas of the Gravid Uterus are preserved in the Hunterian Museum. They are nearly all done in red chalk; for the most part they are by Van Rymsdyk; a few by other artists. The copper-plates are the work of various celebrated engravers—two are by Sir Robert Strange. From the drawings the dates of 27 out of the 34 plates can be certainly determined, and from the nature of the plates these dates tell when the work was done. The drawing of the large dissections had to be made within a few days of obtaining the subjects, for Hunter did "not allow the artist to paint from memory or imagination, but only from immediate observation." Even the smaller figures, which are still represented by preparations in the museum, must have been done principally when they were fresh, for minute details are shown, which were necessarily obscured in converting the dissections into permanent preparations.

Ten of the plates are taken from the 1750 case (Nos. I.-X.); one is dated 1754 (No. XV.). No. XXVI. from another source is

<sup>1</sup> Hunter's *Gravid Uterus* appeared in 1774. The plates were accompanied by descriptive text in English and Latin, which obviated the necessity for translation. It was an elephant folio, printed by Baskerville of Birmingham.

In 1815 a second edition was printed by Messrs. Cox, of the Borough, London, who had bought the copyright from Matthew Baillie. In 1851 a third edition was issued by the Sydenham Society, folio, the plates being doubled. The whole work was also copied full size in Caldani's *Icones Anatomicae*, vol. iii., Venice, 1810.



found to be of the same date, which make twelve certainly in this period of 4 years. Plates Nos. XVI.-XX., XXIII.-XXIV., XXVII.-XXVIII., and part of XXIX. date from 1764; Nos. XI.-XII., XXV., and the rest of XXIX. from 1765; No. XIV. from 1766. Three drawings are dated 1770, and one 1772, all of which are in Plate XXXIV. Of the undated plates Nos. XIII., XXI., XXII., and XXXII., from their style seem to belong to the early period of the work, viz. 1750 to 1754. Writing in 1764<sup>1</sup> he mentions that "sixteen plates were finished . . . several years ago," a statement which lends probability to the above opinion as to the date of these four. Nos. XXX. and XXXI. probably belong to the middle period, 1764-66; and No. XXXIII. to the last, the style and subjects of the figures in that plate being exactly like those of Plate XXXIV., the date of which, in part at least, was 1770-1772.

There was thus a long break after 1754 in which little was added to the work; then under date of March 15th, 1764, he writes: "At last, on the 11th of February, I was so fortunate as to meet with a gravid uterus, to which, from that time, all the hours have been dedicated which have been at my disposal. I have been busy in injecting, dissecting, preserving, and showing it, and in planning and superintending drawings and plaister casts of it, neither of which can possibly be finished for some time."<sup>2</sup> The year 1766 saw the work nearly complete.

The first ten plates are represented in the museum by a number of plaster of Paris casts. These were taken actually from the same subject, and show the same stages of the dissection as certain of the drawings; they were subsequently coloured after nature. "The whole of them are exactly nature herself, and almost as good as the fresh subject. We have a good many of them to help us on; they are most useful, especially where it is so difficult to get a subject of this kind to explain upon in a course of lectures."<sup>3</sup> No preparations can with certainty be identified with these, except that from which the last figure of Plate X. (a supplementary one from another case) was taken; some of Nos. 22 to 23 of Series 48 may have been from the same uterus, as the injection corresponds to that described in the plates. Then there are seventeen preparations which represent the foundations of twenty out of the remaining twenty-four plates. Naturally the preparations are now seen

<sup>1</sup> *Medical Commentaries*, Supplement, p. 33.

<sup>2</sup> *Ibid.*, p. 32.

<sup>3</sup> *Midwifery Lectures*, MS., R.C.S., Eng., 42, c. 31, p. 1.



in the last stage of the dissections. The figures show, in some cases, the whole preparation, in others only particular parts of them. Some preparations appear in several different views. In all, the seventeen represent twenty-eight figures.

For the teaching of the anatomy, apart from microscopic anatomy, of the gravid uterus and membranes, and the general principles of placental structure and physiology, a better series of preparations could not be desired; and to the microscopic study of these organs they form the best possible introduction.

The wonderful fulness and accuracy of William Hunter's descriptions of the anatomy of the gravid uterus and of the physiology of pregnancy is now admitted; but it was not always so. The story of how they were discredited, overwhelmed by the errors of other investigators, and how they were revived sixty years or so later, is a most interesting and curious chapter in the history of science. It is to be found in full detail in the powerful essays of the late Dr. Matthews Duncan, who constituted himself the guardian of William Hunter's scientific reputation. "Numerous authors," he wrote in 1858,<sup>1</sup> "in our own day, especially E. H. Weber, Sharpey, and Coste, have acquired a harvest of fame for re-discovering and proclaiming what we have shown that William Hunter demonstrated and described in 1775, and that not casually and carelessly, as if he had stumbled unexpectedly on truth, but carefully and with reiteration." "No sooner do we leave the guidance of William Hunter, than we fall into a long-continued tissue of errors, of blunders, and of misrepresentations. I am not aware of any instance of such retrogression from truth to untruth, from clearness and simplicity to doubts and confusion, in the history of any science continuously pursued by men of zeal and ability; and, in the present instance, the heart is touched with a feeling akin to pain, when we reflect that the leaders in this unfortunate direction were the nearest relatives of William Hunter—viz., John, his brother and his pupil, and Matthew Baillie, his nephew; for both of whom, it is fortunate that, in other quarters, there is an ample reserve of well-won fame."

In 1780 John Hunter communicated to the Royal Society a paper "on the Structure of the Placenta," in which he laid claim to certain discoveries which had for years been ascribed to his brother. The account which he gave of their discovery was,

<sup>1</sup> *Edinburgh Med. Jour.*, Feb., 1858, reprinted in *Researches in Obstetrics*, p. 226.



that, one day in 1754, along with Dr. Mackenzie, Smellie's assistant, he had dissected a gravid uterus at term, the arteries and veins of which had been unusually successfully injected by Dr. Mackenzie. In the dissection, he stated, he observed certain appearances which he supposed to be new. He completed the dissection, and made the parts into preparations.<sup>1</sup> In the evening, full of the new discoveries, he came and described them to his brother, who at first treated him and them "with gentle raillery," then went and saw the preparations, and was convinced of their truth. But, subsequently, when he described the discoveries in his writings he neglected to state how they were made.

In virtue, then, of that one dissection John Hunter considered himself "as having a just claim to the discovery of the structure of the placenta and its communication with the uterus, together with the use arising from such structure and communication [viz. the nature of the connection between the mother and the foetus], and of having first demonstrated the vascularity of the spongy chorion." Spongy chorion was the old name of the structure for which William Hunter, to get rid of confusion, invented the name decidua, which it still bears.

In the story of the dissection John Hunter laid claim to the most important anatomical discoveries, which William Hunter had already published as his own in the engravings of the *Anatomy of the Gravid Uterus*; and in the rest of the paper he, on the one hand, forestalled his brother in the publication of the physiological discoveries which form the very pith and marrow of the *Anatomical Description of the Gravid Uterus* (which he had long promised, but had not yet been able to complete), claiming them as his own; and, on the other, controverted certain of his brother's most cherished opinions.

In reply William wrote to the Royal Society protesting against John's claims, and pointing out that in regard to the connection between the mother and the foetus the doctrine had already been printed thirteen or fourteen years before in Haller's *Physiology* as his, and by him communicated to Haller; and that for many years past he had treated of it in his lectures as his own. "In the third place," he added, "occasionally in what I have printed, and in my lectures, I hope I have not overlooked opportunities of doing justice to Mr. Hunter's great merits, and of acknowledging that he has been an excellent assistant to me in this and in many other pursuits. By doing so, I always felt an inward gratification (shall I call it?) or

<sup>1</sup> Not identifiable.



pride. I have given him all the little anatomical knowledge that I could communicate, and put him into the very best situation that I could for becoming what the society has, for some time, known him to be. May it be presumed, then, that I stand possessed of the discovery in question till proofs shall be brought to dispossess me. I shall most willingly submit to the pleasure of the society. If they signify an unwillingness that this emulation (shall I call it?) should go on, I shall acquiesce and be silent. If curiosity, justice, or the laws and practice of the society should incline the council to seek out and determine upon the merits, I shall be equally ready to obey their commands. And if it should appear reasonable to them, I would first beg to know the grounds of Mr. Hunter's claim, as I am too well acquainted with his abilities not to think that he must be able to support his claim by something that I am ignorant of. And if I should receive that satisfaction, I shall immediately show that I am more tenacious of truth than even of anatomical discoveries. But if that information should not alter my thoughts on the question, I shall show to the satisfaction of the society, if I can at all judge of my employments and pursuits, that my pretensions arise out of a long series of observations and experiments made with a view to the discovery in question; that it was not a random conjecture, a lucky thought, or accidental occasion, but a persevering pursuit for twelve or thirteen years at least, the progress of which was always publicly known here, and admits of the most circumstantial proof."<sup>1</sup> John replied by reasserting the truth of his story, and offering to share the credit of the discoveries. "Reflection on the famous judgment of Solomon will not tend to confirm the long-delayed claims of John."<sup>2</sup> Of the two accounts of the circumstances of the discovery that of William certainly seems the more probable. The society refused to admit the paper to the *Transactions*, as the facts had already been printed, and also declined to enter into the controversy, which there ended so far as the principals were concerned, but the quarrel remained. Apparently it was mended when John, three years later, asked to be admitted to the care of his brother in his last illness; but William did not alter the will by which everything he owned was left away from John.

In 1786 John published the paper which was the cause of all the trouble,<sup>3</sup> and therein inaugurated the errors which were destined to

<sup>1</sup> Ottley's *Life of John Hunter*, vol. i. of *Works*, Palmer's edition, p. 77.

<sup>2</sup> Duncan, *Researches in Obstetrics*, p. 230.

<sup>3</sup> In *Observations on the Animal Oeconomy*, *Works*, Palmer's edition, vol. iv.



supplant the correct views of William Hunter. How they also came to be attributed to the latter is a cruel instance of the irony of circumstances. At his death the carefully corrected MS. of the *Anatomical Description of the Human Gravid Uterus*, now preserved in the Hunterian Museum, passed, still incomplete, into the hands of Matthew Baillie. The description of the decidua and placenta in the earliest stages of pregnancy, and the manner in which the ovum becomes implanted in the uterus, presented difficulties to William Hunter, many of which still present themselves to us; and at the point where these subjects were to be taken up his MS. stops. His observations at the time he wrote went back no earlier than the third month for the gravid uterus in the dead body, and the sixth week in miscarriages. He was therefore unable to describe how and when the decidua was formed, and how the ovum becomes enclosed in the decidua reflexa. "We cannot get women and open them—one at two days and another at six days after they were pregnant to examine."<sup>1</sup> As to the nature and anatomical arrangements of the decidua he had no difficulty; Plate XXXIV. of his great work is plainness itself on these points. The lectures of 1775 agree with what appears in the atlas of 1774, and with his own parts of the MS.; also, it is plain from the MS. catalogue of his collection, and from his latest writing—"The Introductory Lectures to his last course of lectures"—that he never changed the opinion expressed in his earlier works that it was the uterine mucous membrane modified to meet the peculiar conditions of pregnancy. "The gravid uterus," he says, "is a subject likewise, which has afforded me opportunities of making considerable improvements; particularly one very important discovery; viz. that the internal membrane of the uterus, which I have named decidua, constitutes the exterior part of the secundines, or after-birth; and separates from the rest of the uterus every time that a woman either bears a child or suffers a miscarriage. This discovery includes another, to wit, that the placenta is partly made up of an excrescence from the uterus itself. These discoveries are of the utmost consequence, both in the physiological question about the connection between the mother and child; and likewise in explaining the phenomena of births and abortions, as well as in regulating our practice."<sup>2</sup>

<sup>1</sup> *Lectures*. MS., R.C.S., Eng., 42, c. 31, p. 69.

<sup>2</sup> *Introd. Lects.*, p. 61. All the principal passages from the authentic works, and the clearest one from the lectures are quoted in the present *Catalogue of the Anatomical and Pathological Preparations of Dr. William Hunter*, Series 48.



Baillie did not at first realize the value of the MS. that had come into his hands, and it was not until 1794 that he published it. Then he states in his preface, "‘What appeared to be wanting, I have attempted with much diffidence to add,’ a resolution as unfortunate for obstetric anatomy as it was ill-advised in him."<sup>1</sup> John Hunter in his paper had described the decidua as originating as an exudation of lymph (fibrinous exudation) from the vessels of the uterus due to the stimulus of impregnation; the ovum pushed itself into the middle of this lymph, and became attached to it; the lymph continued to be a living part for the time, and the vessels of the uterus ramified upon it, or, where the vessels of the foetus form the placenta, passed through it and opened into the cellular substance of the placenta. In a note he compared this process to the encapsulation of a foreign body in the tissues.

To William Hunter’s MS. these erroneous views are added in Baillie’s handwriting. In the published work, the opinion as to the nature of the decidua appears as if it had actually been that of William Hunter, and accordingly it has commonly been attributed to him as a later view. The theory as to the enclosure of the ovum in the decidua has also been attributed to him, though it is clear that it was only the view of Baillie or of John Hunter. Adherence to the erroneous views of John Hunter vitiate all that was written on these subjects for about half a century, and many were the ingenious theories raised to meet the numerous difficulties to which these views gave rise. To Coste<sup>2</sup> belongs the credit of finally re-establishing the correct teaching of William Hunter; even he, however, attributes John Hunter’s description of the decidua to William as his later, but less correct views.

How much foundation there was for the claims of John it is impossible now to say, but the probability is that William’s acknowledgment that he assisted him in most of the dissections was quite sufficient, and that nearly all the credit of the discoveries belonged to William.

Where the brothers are in agreement, the descriptions of William are far superior in clearness and detail. Moreover, the vascularity of

<sup>1</sup> Matthews Duncan, *op. cit.*, p. 227.

<sup>2</sup> *Histoire du Développement des Corps Organisés*, Paris, 1847, 8vo, p. 212 (Atlas, large folio). Coste’s note is highly appreciative of William Hunter’s work, and very fair to him. The above erroneous theory he does not attribute to him, but to later physiologists. He does not mention John Hunter or Baillie.



the decidua from the uterus, the mode of termination of the arteries and veins of the uterus in the placenta, the fact that the injection from them had passed into natural cavities among the foetal vessels yet had not passed into those foetal vessels, are all demonstrated clearly in the illustrations which were made by William Hunter in 1750, and it is unreasonable to suppose that they were figured then, yet only understood in 1754. John's absurdly meagre quotations from his brother's lectures of 1755, intended to show that even then the latter did not understand the placenta, prove nothing.

As to the absence of communication between the circulation of the mother and that of the foetus, the main fact that nothing can pass from the one to the other "except by rupture or transudation," became known to William Hunter many years earlier. His account of the discovery is as follows; it is added to the MS. of the "*Anatomical Description of the Gravid Uterus*" as a note which, in point of time, was clearly written later than the body of the text, perhaps after the quarrel with John, and intended as an answer to him, but of that there is no definite proof: "The first time (in the year 1743) that I injected the vein of the navel-string, while the placenta adhered to the uterus, in separating these two parts, it was evident that the injection had nowhere passed further than the placenta, except at one place where a small convoluted vessel (no doubt an artery) was traced, distinctly filled with wax, some little way into the substance of the uterus; but upon examination it was evident that there was extravasation in that part of the placenta, and by many trials I know that water, or any fluid fit for transudation, thrown into the umbilical arteries or veins, readily gets into the cellular cavities of the placenta, and thence into the vessels, especially the veins of the uterus."<sup>1</sup> The placenta he described as composed of two parts intimately blended, the one uterine, being the decidua, the other foetal, being formed by the prolongations of the branchings of the vessels of the umbilical cord. These two elements he was able to separate in the placentae of many of the lower animals; also, however finely he might inject the vessels of the uterus, those of the umbilical cord always "remained uninjected." "It was this appearance," he says (in his lectures of 1775), "in the cat and bitch that first led me into the apprehension that the human placenta was the same. I thought this a long time, but I never cared to assert it openly till within these few years."<sup>2</sup> This was, he admitted, not altogether a new

<sup>1</sup>Dr. Edward Rigby's edition, p. 39, 1843.    <sup>2</sup>MS. R. C. S., Eng., 42, c. 31, p. 37.



discovery; with respect to animals, "this was the opinion of Needham,<sup>1</sup> that it was made of two sorts of vessels, the one uterine, the other foetal, both blended together, but he does not assign any reason for it, or say that it was distinctly so in the human body." Harvey also clearly states that there was no mixing of the two bloods.<sup>2</sup> But the actual anatomical proof of these facts was wanting, and William Hunter supplied it. In his earlier days the prevailing opinion was that "the red blood passes by continuity of canal from the uterus into the blood-vessels of the foetus," circulates through its body and returns again to the mother. Strange to say, the holders of this opinion also thought that the foetus was nourished by swallowing the liquor amnii. Hunter finally and conclusively proved the reverse, and established correct notions as to the nutrition of the foetus *in utero*. "From all I can make out by injections and every other way I shall certainly conclude that the red blood does not pass from the mother to the child. I no more doubt this than I do that the blood does not pass from the hen to the chick."<sup>3</sup>

Concerning the nutrition of the foetus, he held that "the child is entirely nourished by the navel string." As to how this was effected he had difficulties. "For my part I think all this is done by absorption, and the navel-string and its branches are like the roots of a [the] child which are bathed in the blood and the juices of the mother, which they absorb and take up and carry to the child; and no doubt what is redundant in the child is returned to the mother."<sup>4</sup>

As to what he meant by absorption in this connection, there is no clear passage that can be quoted; he thought there might be "some kind of vessels with valves that when juices get in a little way

<sup>1</sup> *De Formato Foetu*. Walter Needham, 12mo, London, 1667.

<sup>2</sup> *De Generatione Animalium*. London, 1651.

<sup>3</sup> In favour of the other view, Hunter was accustomed to tell his students there were many cases on record of mothers having bled to death by the navel string, and of foetuses found bloodless through a flooding that had destroyed the mother. "Thus it is asserted, but they are deceived . . . there is no believing these things unless they come from a man of great accuracy and delicacy. He should be accurate in his observations and faithful in his narratives. These qualifications do not combine among philosophers and learned men once in one hundred times; most philosophers, most great men, most anatomists, and most other men of eminence lie like the devil." Plain speaking for a professor addressing his class! *Midwifery Lectures*. MS. 42, c. 31, in the library of the R.C.S., Eng., pp. 96-97.

<sup>4</sup> *Midwifery Lectures*. MS. R.C.S., Eng., 42, c. 31, pp. 98 and 100. The simile of the hen and the chick may have been borrowed from Harvey. That of the placenta as the root of the child, John Hunter gave as his own in 1780.



they cannot return back again; but then these do not run on and terminate as others in the large vessels or veins adjoining." In fact, he could not explain how the interchanges took place; his difficulties are referred to in an earlier part of this introduction. On the structure of the human placenta he is not absolutely in accordance with the views generally accepted at present. He regarded it as made up of the foetal vessels, and a spongy substance between them full of cells in which the maternal blood circulated. This substance he saw as white uninjected processes of connective tissue between the foetal vessels, and he regarded it as formed by the decidua which sent minute processes into every part of the placenta right to the outer surface of the chorionic membrane which forms its inner limit. These placental cells, which are now called the intervillous spaces, it is clear, he regarded as special blood-cells, which he compared to those of the *corpus spongiosum penis*, and not merely as the interstices of the connective tissue, though Rigby, in the notes to his edition of the *Description of the Gravid Uterus*, attributes that view to him. Nor can it be supposed that he regarded the maternal blood in them as extravasated. Microscopic sections show that, from the second month at least, there are not processes of decidua such as he described throughout the placenta; there is connective tissue between the foetal vessels, but it is that of the chorionic villi. He was right in describing the placenta as a compound organ inasmuch as the decidua is maternal; how far he was right in describing a maternal element all through it depends on a refinement which it is impossible he could ever have contemplated, viz. the nature of the epithelium of the chorionic villi—whether it is all foetal or partly maternal, partly foetal, is a question that remains for the future to settle.

The extent of William Hunter's investigation of the comparative anatomy of the placenta is not shown in any of his works; he never published it in detail. His references to it show that his knowledge was accurate and of considerable extent. The descriptions in the MS. catalogue are very meagre, and do no more than confirm the above impression. As to the beauty and instructiveness of the preparations there can be only one opinion: they give a clearer idea of the principles of placental anatomy than can be obtained in any other way. There are preparations from the sow, mare, sheep, cow, cat, bitch, and rabbit, for the most part injected and dissected, and of a foetus and placenta from the sloth, which, however, is neither injected nor dissected. The



little that he wrote about them and the style of his references show that he studied them principally for the sake of the light they threw on the structure of the human placenta; most of his studies of comparative anatomy being directed to the improvement of human anatomy. "The structure of some parts may be so delicate, or involved in the human species, as to be undiscoverable; yet in another species the structure of those very parts may be apparent. Accordingly, many things have been first discovered in comparative anatomy, and were afterwards found out in the human body. Even monsters, and all uncommon and all diseased animal productions are useful in anatomical enquiries; as the mechanism or texture which is concealed in the ordinary fashion of parts, may be obvious in a preternatural composition. And it may be said that Nature, in thus varying and multiplying her productions, has hung out a train of lights that guide us through her labyrinth."

Among the comparative anatomy preparations there are several of the allantois. It is not recognizable in any of the human preparations, and for this reason William Hunter denied its existence altogether in the human subject. There were plenty of descriptions of the human allantois current in his time, but these were either erroneous observations or were wholly imaginary. Indeed it was unlikely that, with the means at his command, he should have recognised the little tubular diverticulum which represents it. He made no attempt to describe the development of the embryo, perhaps wisely. The earliest conception figured in the atlas is at the fifth week, and the embryo is little more than outlined; but in the collection there is a beautiful little preparation of a conception which cannot have been much more than three weeks old, and which is probably the one referred to in the preface to that work. "Even since the last plate was finished he had an opportunity of making a drawing of a younger embryo than he had before seen," and he promised to offer to the public a description of it and also of "a very curious case"—"a conception in the Fallopian tube," "probably in the way of a supplemental plate or with the anatomical description of the gravid uterus which he proposes to publish at full length." He never carried out this scheme, and there is no detailed description of either of these cases, nor sketches of the embryo in the museum. The embryo and placenta from the extra-uterine case are the original of the illustration in Quain's *Anatomy* "after Allen Thomson," tenth



edition, vol. I., pt. i., p. 104, fig. 124. Professor Thomson sketched it for the seventh edition, 1867, in which it appeared as fig. 603.

There are a few other papers which must be mentioned on account of their connection with the museum and for their general interest.

The wet preparation which figures in the well-known portrait of William Hunter by Sir Joshua Reynolds is of special beauty and interest. It is a dissection of a finely injected gravid uterus in the fifth month from a case of retroversion of that organ. This condition seems to have been observed, but certainly was not properly described or properly understood till Hunter's investigation in 1754 of the very case from which this preparation was obtained. He described the condition and the symptoms and mode of treating it in his lectures thereafter, and prepared a plate of it for his atlas. Circumstances, however, bringing it to his knowledge that the condition was not yet so widely known as it deserved to be, and that lives had been lost which might have been saved had his observations been better known, he published a full account of them as a separate paper in vol. iv. of *Medical Observations and Inquiries* in 1770. The plate is No. XXVI. in the *Atlas of Anatomy of the Gravid Uterus*.

After his death there also appeared three papers in vol. vi. of the same prints, two of which were frequently referred to by his contemporaries and reprinted in various works, and are still well worth reading.<sup>1</sup>

The third was on *Three cases of Mal-conformation in the Heart*, but no preparations relating to those cases now remain in the museum. The malformation was stenosis of the pulmonary artery with defect of the interventricular septum, and the condition to which it gave rise was congenital cyanosis or *morbus coeruleus*. His description of the appearance of the victims of this condition has become classical, and his explanation of the cause of the cyanosis, which gives the disease its name, though not the whole truth, is part of it, and is correct so far as it goes. But, surely

<sup>1</sup> Dr. Hingston Fox in his *Oration before the Hunterian Society* (printed in their *Transactions*) in 1897 has given a very interesting account of all three papers. The first is *The successful cure of a severe disorder of the stomach by milk taken in small quantities at once*. The second is *On the uncertainty of the signs of Murder in the case of Bastard Children*; it has been very highly praised by Sir Benjamin Brodie, *vide* p. lxxvii. The reference to the third is given in the text.



William Hunter was peculiarly unfortunate in having theories wrongly fathered upon him. The now discredited hypothesis that the cyanosis was due to the mixing of the blood of the right and left ventricles from the imperfection of the septum has been attributed to him ever since 1855 at least. His writings show no trace of any such opinion. He attributed the cyanosis to "the want of the full effect of respiration on the blood," of which, from the malformation, only a part passed through the lungs.<sup>1</sup>

Purchase did not bulk largely in the formation of this part of the museum. Besides the preparations bought at Falconar's sale, Hunter (apparently about 1778) purchased for £200 the collection of Dr. Francis Sandys, formerly a practitioner and a teacher of anatomy in London, which was rich in injected preparations and dissections of the eye, but none of the preparations from it can be identified.<sup>2</sup> Hunter mentions him as the inventor of the method of rendering preparations translucent by means of turpentine; a kind of preparation of which there are many examples in the collection. He also mentions him as having discovered the membrana pupillaris, and as having possessed preparations of it; there are several examples of this in the museum, but they may be Hunter's own, as he records that he succeeded in injecting it himself.<sup>3</sup>

In the list of his unpublished works Simmons<sup>4</sup> mentions that William Hunter "had long been employed in collecting and arranging materials for a history of the various concretions that are formed in the human body." He had "nearly completed that part of it which relates to urinary and biliary concretions, and prepared a number of illustrations for it before his death." No MS. connected with this work can be found beyond a number of short notes regarding various specimens, but there are 21 plates (with proofs) containing a large number of figures, nearly all taken from the calculi and concretions, of which there are several hundred, in his collection. The notes are utilized in the present catalogue, and references are given to the figures, which are very well executed and accurate engravings. The original sketches, for the most part in red chalk, by Van Rymsdyk, are also in the museum.

<sup>1</sup> This historical error has at last been corrected by Dr. Laurence Humphry in Clifford Allbutt's *System of Medicine*, 1898, vol. v., p. 722.

<sup>2</sup> Simmons, p. 14, is the authority for this purchase. He does not give the date.

<sup>3</sup> *Medical Commentaries*, p. 62.

<sup>4</sup> *Op. cit.*, p. 50.



To return now to the lectures, which were the *raison d'être* of the collection, and which determined its general shape.

Regarding William Hunter's teaching we know a good deal: (1) from tradition—he was the most celebrated teacher of anatomy of his day in Britain; (2) from the two *Introductory Lectures* already referred to, which he left corrected for the press, and which were published the year after his death; and (3) from students' notes of his lectures, of which there are several good sets in existence in various libraries.

The first introductory lecture is taken up with a concise history of anatomy, and some remarks on recent advances in science. In the second he discusses the subject-matter of anatomy, the practical importance of the science to medicine and surgery, and details the plan of his lectures. We have here, in fact, an account in his own words of what he intended his anatomical teaching to be, and how he proposed to carry out his intentions. Incidentally the lectures throw a great deal of light on the condition of anatomy and anatomical teaching in Britain in his day and earlier; their accuracy is testified by the use made of them in the report of the Select Committee on Anatomy. They are truly philosophic and at the same time practical introductory lectures.

The students' notes supply details of the scope and character of his teaching, the way he used the anatomical museum, and (perhaps in a not very reliable way) his opinions on subjects not treated in his published works. In writing the catalogue everything that might throw light on the source or purpose of preparations was of interest, and naturally the reports of his lectures, as well as his printed works, were investigated in search of information. The best notes of them in the library of the Royal College of Surgeons of England, with the kind permission of the Council of the College, were copied for the University; they proved most useful to the author of the catalogue.<sup>1</sup> The notes read like verbatim reports; probably they were taken in shorthand and re-written; comparison

<sup>1</sup> Several sets of notes were examined, and, to a certain extent collated. There are no less than seven sets in the College of Surgeons, but some of them are very brief notes, and several are incomplete. The excellent set copied for Glasgow University was made up from three different ones. The anatomy lectures from No. 42, c. 28-29; the midwifery from No. 42, c. 31; the operative surgery and one or two other short parts from No. 42, c. 25, which is not so perfect as the other two, but was the only one that contained these lectures. There is a good set in the Royal College of Physicians of England, and an excellent set in the Royal College of Physicians, Edinburgh.



of parts of them with his printed works shows that they are fairly accurate reports—uncommonly good for students' notes. That such good sets of notes should exist is not surprising, for the notes of these lectures were treasured by their owners as valuable books of reference through all their lives. Good sets of them were passed from hand to hand among those who could not actually attend the lectures, and were frequently copied. Hunter desired his students to attend two courses, which they were able to do in one winter, and during the first to take no notes; "his [the student] business is, first of all, to get clear ideas of everything. His eyes and ears are to be employed in that service only. He is first to understand; let him remember as he can." In the second, he should take careful notes and re-write them afterwards. Many students (we know from *Medical Commentaries*) actually attended course after course for two, or even three, winters, and were thus able to get their notes very complete.<sup>1</sup> To describe Hunter's courses as anatomy lectures conveys a very inadequate idea of what they were. They embraced anatomy, physiology, and pathology, and also courses of operative surgery and midwifery. The autumn course of 1775 (MS. No. 42, c. 25) consisted of 112 meetings, which is probably about the average, and extended over about three and a half months. The lectures were given daily, Saturdays as well as week days, and extra evening lectures had to be added to make up this number in that brief time. William Hunter delivered most of the day lectures himself; it was a regular engagement with him; but the evening lectures, and certain of the day ones were left to his partner, who also had to lecture if "the Doctor" happened to be called away on urgent business, or were indisposed. Of the 112 lectures, 2 were the introductory ones; 80 were devoted to what was included under the term anatomy; 15 were on operative surgery; 3 on the making of preparations and embalming (a subject to which William Hunter had devoted a good deal of attention); and the remaining 12 on midwifery, about half of them being anatomical. The importance of these courses can hardly be over-estimated; with the exception of chemistry and materia medica, they were the whole of what may be described as the science part of a medical curriculum in those days. The meetings lasted two hours, which some people thought too long, but there was "useful

<sup>1</sup> *Medical Commentaries*, p. 8, *et seq.* It was from notes taken in shorthand and re-written that John Hunter's surgery lectures were printed. *Works*, Palmer's edition, vol. i.



business enough for two hours a day," and the diligent student seldom tired, for they were not merely lectures, but largely demonstrations, being illustrated by dissections of the fresh subject, supplemented by permanent preparations from the museum. The notes in many places have a scrappy character and other indications that the lecturer was demonstrating upon the body and commenting upon what he showed, and in some of the sets of notes there are lists of the preparations exhibited. "In explaining the structure of parts, if a teacher would be of real service, he must take care not merely to describe, but to show or demonstrate every part. What the student acquires in this way is solid knowledge arising from the information of his own senses; thence his ideas are clear and make a lasting impression on his memory. It is therefore necessary for giving a complete course of anatomy to provide a number of fresh subjects, and to have a competent stock of anatomical preparations." He was very careful that preparations should not supplant the fresh subject. They "should not be used as substitutes for a body; but supplementally, to demonstrate such circumstances clearly as are intricate, confused, or invisible in the fresh subject. And a demonstrator who makes fine preparations should be very much upon his guard; otherwise he will be apt to make an abuse of preparations; he will insensibly contract a partiality to that in which he excels; the elegance of preparations is delusive with students; and the more they are used there will be less expense and trouble with fresh subjects." Properly used, he had no doubt as to their usefulness, and "they serve two purposes chiefly, to wit, the preservation of uncommon things, and the preservation of such things as required considerable labour to anatomize them so as to show their structure distinctly. Of the first sort are the pregnant uterus, diseases, parts of singular conformation, etc. Of the second class are preparations of the ear, the eye, and in general, such as show the very fine and delicate parts of the body, which we call the minutiae of anatomy." Wet preparations he preferred to dry, "because they are more like nature." The preparations were handed round the class, and students were requested to handle them carefully, and on no account by pressing or bending to try their strength or texture. "With all possible care they are constantly wearing out or growing the worse for use. Many of them are the result of patient labour and not easily restored; many of them are such rarities as are not to be recoverable when lost by any pains that can be taken."



So far as they go the anatomy lectures are excellent, and it is surprising how far they do go, and how accurate they are when judged by the standard of to-day.

With the anatomy was incorporated a "sketch" of the physiology of the parts just demonstrated. First "the structure of the parts, and the known phenomena as *data*," then "briefly, the most prevailing opinions or hypotheses, with the principal arguments that have been brought either to support or to overturn them." Thirdly, "in some instances to give our own opinion with caution and reserve; but more generally to leave your judgments free, that enquiry and improvement may go on."<sup>1</sup> "Lest I should be thought too short in the physiological part, I would beg leave to observe that, as far as it is yet known, or has been explained by Haller and the best of the moderns, it may be easily acquired by a student without a master, provided the student is acquainted with philosophy and chemistry, and is an expert and ready anatomist; for with these qualifications he can read any physiological book, and can understand it as fast as he reads."

Too much time, he thought, was spent on physiological speculations. "In our branch, those teachers who take but little pains to demonstrate the parts of the body with precision and clearness, but study to captivate young minds with ingenious speculation, will not leave a reputation that will outlive them half a century. When they cease from their labours, their labours are buried with them. There never was a man, perhaps, more followed and admired in physiology than Boerhaave. I remember the veneration he was held in; and now, in the space of forty years, his physiology is—it shocks me to think in what a light it appears."<sup>2</sup>

He had no hesitation in "avowing great ignorance in many of the most considerable questions relating to animal operations; such as sensation, motion, respiration, digestion, generation, etc.," or in telling his students of his own mistakes.

After the physiology come observations on pathology, chiefly morbid anatomy and narrations of cases—a part of the lectures on the value of which Hunter laid particular stress. Some of the references to cases it is possible to connect with specimens in the museum.

"The more we know of our fabrick, the more reason we have to believe that if our senses were more acute, and our judgment more enlarged, we should be able to trace many springs of life,

<sup>1</sup> *Introd. Lects.*, p. 97.

<sup>2</sup> *Introductory Lectures*, p. 98.



which are now hidden from us; by the same sagacity we should discover the true causes and nature of diseases, and thereby be enabled to restore the health of many who are now, from our more confined knowledge, said to labour under incurable diseases. By such an intimate acquaintance with the economy of our bodies, we should discover even the seeds of diseases, and destroy them before they had taken root in the constitution."

Finally, his aims in teaching anatomy are summed up in the two following paragraphs.<sup>1</sup> "Anatomical lectures being intended to serve as a solid foundation for two such important arts as medicine and surgery, a teacher cannot take too much pains to render them useful; and if he is limited in time it will require more particular care that the most essential things be well explained. And with that view he must be satisfied with touching more lightly such things as are of less importance and even to pass over many things of little use, though perhaps curious, for in the study of nature there is no end if we give way to curiosity."

"With this view of my situation in life, I have always studied, and shall continue my endeavours, to employ the time that is given up to anatomical studies as usefully to the student as I can possibly make it. And therefore shall never aim at showing what I know, but labour to show, and describe, as clearly as possible what they ought to know. This plan rejects all declamation, all parade, all wrangling, all subtlety. To make a show, to appear learned and ingenious in natural knowledge, may flatter vanity; to know facts, to separate them from suppositions, to range and connect them, to make them plain to ordinary capacities, and, above all, to point out the useful application is, in my opinion, much more laudable, and shall be the object of my ambitions."

From tradition we have ample testimony that he carried out the purpose expressed in these words. Perhaps the best expression of it is to be found in Sir Benjamin Brodie's Hunterian Oration in 1837.<sup>2</sup> "I am not aware that there is anyone present of such an age as to remember what William Hunter was as an anatomical teacher. But tradition supplies the place of memory; and I have, in the early part of my life, so frequently heard him spoken of in that capacity by older persons, that it seems to me almost as if I had been myself his pupil. He is reported to have been at

<sup>1</sup> *Introductory Lectures*, p. 98.

<sup>2</sup> *Works*, collected edition, by Charles Hawkins, 1865, vol. i., p. 443.



once simple and profound; minute in his anatomical demonstrations, yet the very reverse of dry and tedious. Subjects, which were uninteresting in themselves, were rendered interesting by the liveliness of his descriptions, and the more important points were illustrated by the relation of cases and the introduction of appropriate anecdotes, which, while they relieved the painful effort of attention, served to impress his lessons on the mind in such a manner that they could never be effaced. His paper on the structure of the cartilages of joints, published in the *Philosophical Transactions* for the year 1743 (at which time he was only 25 years of age, and in which he anticipated all that Bichât wrote sixty years afterwards respecting the structure and arrangement of the synovial membranes), and his illustrations of the gravid uterus, sufficiently show how correct he was in matters of detail, and at the same time how comprehensive were his general views. But we have evidence that his lectures possessed merits of a higher order than these. His paper on the 'Uncertainty of the Signs of Murder in the Case of Bastard Children,' published in one of the volumes [sixth] of the *Medical Observations and Inquiries*, seems to have been little else than a transcript of a part of one of his lectures; and it is impossible to peruse it without being struck, not only with the intellectual penetration, the great good sense, and the power of argument, which is there displayed, but also of the indications which it affords of a humane, charitable, and even of a tender disposition. If we may venture, from this specimen, to form our judgment as to his other lectures, their tendency must have been to improve his pupils with respect to their moral qualities, fully as much as with respect to their professional attainments."

For the teaching of practical anatomy William Hunter seems to have secured an abundant supply of bodies in spite of the difficulties and dangers with which the getting of them was beset. Fordyce, afterwards one of his trustees, stated in a letter to Cullen,<sup>1</sup> that when he was a student under Hunter he dissected three bodies. Dissection could hardly have been so thorough as it is now, for the means of preserving the bodies were very imperfect, and even in winter they were of little use after eight or ten days. But, since the students had few classes, perhaps even none except anatomy, they probably gave up most of their time to dissection when they obtained a subject. Probably, too, some time was spent in practising

<sup>1</sup> Thomson's *Cullen*, vol. i., p. 124.



operations. Hunter used to advise the student not to dissect till he had first attended a complete course of demonstrations. "Otherwise," said he, "he will be so much at a loss in his work, and receive so little instruction or satisfaction, that at best it will be so much time almost thrown away. It may even create disgust to a study from which he ought to receive pleasure and advantage. But when once he is prepared for this part of his education he cannot dissect too much." Besides that, he should frequent the dissecting-room, where he "will see the preparatory dissection for every lecture; which will make the lecture itself much more intelligible, and fix it deeper in the mind; he will see all the principal parts dissected over and over again; whatever he finds he does not understand, there is such a number of bodies dissected in succession that he will at any time have an opportunity of attending to that particular object, and of getting it explained to him; he will see all the operations of surgery performed and explained again and again, and he will see the practice of all the arts of making preparations."<sup>1</sup>

With respect to procuring bodies for dissection the introductory lectures conclude with the following significant remarks:<sup>2</sup> "In a country where liberty disposes the people to licentiousness and outrage, and where anatomists are not legally supplied with dead bodies, particular care should be taken to avoid giving offence to the populace, or to the prejudices of our neighbours. Therefore it is to be hoped that you will be upon your guard; and, out of doors, speak with caution of what may be passing here, especially with respect to dead bodies." This question of dead bodies was the great difficulty of the anatomist. The principal means by which these were obtained was disinterment. The sinister figure of the "resurrection man" first appeared about the beginning of the 18th century, and up to the passing of the Anatomy Act, he remained almost the sole purveyor of bodies for dissection. At first, a sufficient supply of them was easily obtained; the resurrection men were "circumspect in their proceedings, detection was rare, the offence was little noticed by the public, and was scarcely regarded as penal." But there was a feeling against it; and Hunter foresaw that as dissection came to be more generally practised the desecration of graves would become more frequent and more notorious, the feeling would grow stronger, and with it the vigilance of the law would increase. And so it proved. In his day popular violence was more to be feared than the law; prosecutions even of the actual resurrec-

<sup>1</sup> *Introd. Lects.*, p. 109.

<sup>2</sup> *Ibid.*, p. 113.



tionists were rarely undertaken, and were still more rarely of any effect. But, in 1788 (only five years after his death), the exhumation of dead bodies was decreed a misdemeanour. Still it went on. Other schools besides that of William Hunter arose, and the demand for bodies became greater at the same time as the difficulty of getting them increased. Their value as a marketable commodity rose, the exhumators grew more unscrupulous and desperate, and the public odium against them more bitter. At last, in 1828, the receiving of stolen bodies was decreed a misdemeanour. Under that decision there was scarcely a teacher or student of medicine in Great Britain who was not liable to prosecution.<sup>1</sup>

In 1763, being then in the height of his powers and reputation as an anatomist, William Hunter presented a memorial to the government, in which he proposed a plan for establishing a permanent school of anatomy on the basis of his courses, under royal protection. "Scarce any science or art," runs the memorial, "requires the protection of a prince more than anatomy, as well on account of its great use to mankind, as because it is persecuted by the prejudices, both natural and religious, of the multitude in all nations. Its usefulness indeed is generally allowed; yet the degree and extent of its benefit is known only to the few. It is the only solid foundation of medicine. It is to the physician and surgeon what geometry is to the astronomer. It discovers and ascertains truth; overturns superstition and vulgar error; and checks the enthusiasm of theorists and of sects in medicine, to whom perhaps more of the human species have fallen a sacrifice, than to the sword itself or pestilence. It is likewise, or at least might be, made of considerable use in sculpture and painting."

In spite of all difficulties, he had raised London to the position of one of the best schools of anatomy in Europe, but he foresaw that "without some public and permanent foundation, anatomy, and everything that depends upon it, must sink again to its former state. It will be taught only by young men, as an introduction to business; the name of lecturer, in newspapers, and in private conversation, never failing to give a man some degree of credit. But such young teachers will generally be very indifferently qualified when they begin; and when they have acquired some

<sup>1</sup> *Vide the Report of the Select Committee, and The Diary of a Resurrectionist* by the late James Blake Bailey, 8vo, London, 1896. The decision of 1828 was in the case *Rex v. Davies and others*. Appendix to the *Report of the Select Committee*, p. 147.



ability from experience, that is, when they are just become fit for teaching, they will generally leave it off. They will always find their labour better rewarded (in the vulgar sense of reward), by following the practice of physic or surgery, than by reading lectures. So it has been, in fact; and thence, though we have had many professors, or teachers, in this great town, we have not had one Winslow, Morgagni, or Albinus: nor can it be expected that a Briton should be able to do, in a few years, what is done by the labour of a long life in other countries: especially too, when we consider that there is no provision made by our government for supplying him with subjects, and that in other countries this article is amply provided for.”<sup>1</sup>

More than two years before this Dr. Hunter had felt himself under the necessity of lessening his work, and had proposed giving up his lectures, but he was so strongly urged to continue them, that, after reflection, he decided to continue them for life, “even if he should be obliged to drop a part of his more lucrative employments. He conceived that a man may do infinitely more good to the public by teaching his art than by practising it. The good effects of the latter must centre in the advantage of the few individuals under his care as patients; but the influence of a teacher extends itself to the whole nation, and descends to posterity. With these intentions towards mankind, and with a desire of gaining what the best men have ever esteemed the highest reward, he begs that the Earl of Bute, who knows well the force of such motives, would recommend him to the King’s favour, that he may better execute his plan of giving lectures during his life, and perpetuate a succession of public teachers of anatomy, under the royal protection. What he at present wishes is this: to be allowed a proper piece of ground, that he may forthwith lay out six, or even seven, thousand pounds in erecting a building fit for the purpose, under any condition that may be agreeable to the king.”

He promised whenever the building was complete to hand it over to the public; and he also offered to endow it with his library, which had already cost him between three and four thousand pounds, and his preparations, which were “of more worth to the public because they are things that cannot be bought.”<sup>2</sup> But the government would not “venture openly to patronize” dissection, and eventually his proposal received “a silent refusal.”

<sup>1</sup> *Introductory Lectures*, Petition to the King, p. 119.    <sup>2</sup> *Ibid.*, p. 121.



His disappointment at this treatment of his disinterested offer was very great. He thought of leaving London, and even wrote to Cullen proposing that they should start a new and independent school of medicine in Glasgow. "You have been ill-used at Edinburgh as I have been at London. Could you make a sacrifice of the few more guineas you would receive by practice at Edinburgh, and join with me to raise a school of physic upon a noble plan at Glasgow? I would propose to give all my museum and library, and build a theatre at my own expense; and I should ask nothing for teaching but the credit of doing it with reputation. You and Black and I, with those we could choose, I think could not fail of making our neighbours stare."<sup>1</sup>

What reception Cullen gave the proposal is not known; the plan went no further: perhaps the great burst of research in 1764-65 helped Hunter to forget his disappointment. Besides that, London, he knew, was "the only place for such a school, because a sufficient number of dead bodies cannot be procured in any other part of Great Britain"; and in London his scheme was eventually carried out by his own energy and perseverance, and with his own capital.

In 1770 he moved into the house in Great Windmill Street which he built for the purpose, with dissecting-room, lecture theatre, and a fine museum hall. There he lived, conducting his enormous practice, lecturing, working in his dissecting-room, and building up his museum on an extended plan—embracing objects of art, archaeology, natural history, geology, mineralogy—till his death. His museum became more than a museum for a medical school; he made it a University museum. On the 20th of March, 1783, after having been confined to bed for some days through illness, in spite of the protestations of his friends, he rose and attempted to give the introductory lecture to the operative surgery part of his course. Before the end of the lecture he fainted and was carried to bed, from which he never rose again. He died on the 30th of March, in his 65th year.

After his death it was found that, by a will dated July 27th, 1781, he had left his museum and £8000 to Glasgow University, but with the condition attached that it was to remain in London for the use of his partner Cruikshank and his nephew Matthew Baillie for thirty years.

<sup>1</sup> Thomson's *Cullen*, vol. i., p. 150.



Matthew Baillie<sup>1</sup> was the only surviving son of James Baillie, minister of Shotts, Bothwell, and Hamilton successively, and afterwards Professor of Divinity in Glasgow University, and of William Hunter's sister Dorothea. He was born at the manse of Shotts on the 27th of October, 1761. He entered Glasgow University in 1774 as an arts student. Three years later, although his inclinations were rather towards divinity or the bar, he chose medicine as his profession on account of the prospects offered by his connection with the Hunters. His father had died in 1778. As he desired to take an English degree in medicine, he applied for and obtained in 1779 a Snell Exhibition to Oxford. In the spring of the same year he proceeded thither by way of London, where he was to meet his uncle William, and discuss his future line of action. To William Hunter he became as a son.<sup>2</sup> "He spent the whole of his time after the first year with William Hunter, except during the 'terms,' which amounted to only a few weeks annually." In two years from the commencement of his medical studies he began to assist in the teaching in the Great Windmill Street School. He held the Snell Exhibition, which was worth £120 per annum, for the full period (as it was then) of ten years. At Oxford he graduated B.A. in 1783, M.A. in 1786, M.B. in 1786, and M.D. in 1789.

Besides the interest in the museum, William Hunter left him about £100 a year, and the family estate at Long Calderwood. The latter he immediately gave up to John Hunter. It returned to him in after years, and is still owned by his descendants.

Glasgow University showed its appreciation of the value of its legacy by trying to persuade Matthew Baillie to give it up at once in return for a consideration. The professor of anatomy at that time was William Hamilton (father of the great metaphysician), who had been a student under Hunter, and who had charge of his dissecting-room a few years earlier, before his appointment to the University. But Baillie had his own views about the museum, and stated them with decision, as follows:<sup>3</sup>

LETTER TO R. BARCLAY, ESQ.

Dear Sir,—I scarce think it is proper for me to be at this

<sup>1</sup> These particulars are taken principally from the biography in Wardrop's edition of his works, 8vo, London, 1824, vol. i., and from the records of Glasgow University.

<sup>2</sup> William Hunter never married.

<sup>3</sup> The Hunter-Baillie MS., vol. i., *Dr. M. Baillie*, p. 10 et seq. Published by kind permission of Miss H. Hunter-Baillie.



meeting, but you have here written down everything I have to say about this business.

1st. I will cheerfully give up to the College of Glasgow, providing the executors and Mr. Cruikshank give their consent, every article in the museum except the anatomical preparations, the few pictures in the house, and a few professional books in the bedroom, for what impartial judges shall reckon a proper consideration.

2nd. The anatomical preparations cannot be given up, because I cannot live without lectures, because my success in life will probably depend upon lectures, and because part of Mr. Cruikshank's support is derived from lectures, with whom I have entered into a written agreement.

3rd. If Glasgow insist upon it, I shall give up the pictures and the few books, rather than that measures in contemplation having so proper an object should not take place.<sup>1</sup>

Under those circumstances I shall with the greatest pleasure give up the collection to Glasgow, and I wish most heartily the scheme may meet with no interruption from any party concerned. You know I believe my reasons for not wishing to be present at this meeting. My situation with the executors makes it proper that the scheme should be proposed to me as well as to them, and that I should not of myself make any bargain with Glasgow, which cannot be valid without their consent.

Whenever it is proposed by mutual friends I shall agree to it most willingly.—I am, dear sir,

Yours sincerely,

M. BAILLIE.

(Copy. No date.)

But the University evidently wanted the anatomical preparations.

On the other hand, Combe, the author of the catalogue of Hunter's collection of coins, and one of the trustees, desired to keep the medals in London, and tried to raise a subscription to buy them from Glasgow, for which an Act of Parliament would also have been necessary. The correspondence seems to indicate that there was some disposition to disregard Matthew Baillie in the matter. So far as is known, it closes with a letter from which the following is an extract. It is supposed to have been addressed to Dr. Fordyce, another of the trustees.

"I own I was much surprised, and have not yet ceased to wonder

<sup>1</sup> It is not known what this object was.



at the proposal made to Mr. Combe in your first letter. It was proposed in that letter that, in order to induce Glasgow to part with the medals for a price *greater* than their *value*, the other parts of the collection should be given up to them.

"In this proposal, which was general, the anatomical preparations were included. To give up which implies giving up two-thirds of my present income, one-third of Mr. Cruikshank's income, and likewise all the probable chance of my success in life. I think it might have occurred as you knew my fortune exactly, and had some tolerable idea of Mr. C.'s situation, that this sacrifice was too much to be expected.

"I thought you had a better opinion of me than to suppose I should wish to sit down as an idle gentleman upon £100 and afterwards £200 per annum. But, since this is not the case, I should wish you to believe that my ambition is to spend an active and, I hope, a serviceable life; and that I intend to pursue those means which have been put in my power.

"I really could have wished you had not made this proposal, or that now you could make it bear another construction. You have now heard what I have thought and felt upon this subject. It seemed right that I should not conceal it from you."

The upshot was that the whole museum remained in London in the meantime. Baillie, it appears,<sup>1</sup> "had so little besides [the family estate which he gave to John Hunter] that he would have been obliged to leave London, if his lectures had not been successful, but they were a complete success, and from that time his reputation was established as a first-rate lecturer." Two years after Hunter's death he assumed his full place as partner with Cruikshank, and gave his first course of anatomy lectures. At the age of twenty-two he essayed to fill the place of one of the most celebrated teachers of the age; a bold step, but justified by success.

Baillie's reputation rests chiefly on his work as a pathologist. His work on the *Morbid Anatomy of the Human Body* was the first systematic treatise on pathology in the English language. It went through six editions between 1793 and 1824, and was for about fifty years the standard work on the subject. It was accompanied by an *Atlas of Engravings of Morbid Anatomy* (folio), the first fasciculus of which appeared in 1799. Of the 207 figures in it, 114 were taken from preparations in William Hunter's museum. Most of these have

<sup>1</sup> From a note by his daughter, Mrs. Milligan, in Miss Baillie's copy of his life (from Wardrop's edition) and *Lectures and Observations* (*vide ante*), p. 14.



been identified, and references to the engravings are given in the catalogue. The majority of the other figures were from his own collection, now the property of the Royal College of Physicians of London, and from that of John Hunter.

Even before his first work was published Matthew Baillie had begun to succeed in practice, a success that grew so rapidly that he began to have little time for anatomy. In 1787 he was appointed physician to St. George's Hospital. In 1799 he retired from teaching altogether. His practice, almost entirely consulting, became so large that he did but little scientific work after the age of forty; but his practice was founded on the science to which he had devoted his earlier years. He is a most brilliant example of the truth of William Hunter's saying: "Were I to guess at the most probable future improvements in physic I should say that they would arise from a more general and more accurate examination of diseases after death. And were I to place a man of proper talents in the most direct road for becoming truly *great* in his profession, I would choose a good practical anatomist, and put him into a large hospital to attend the *sick* and dissect the dead."<sup>1</sup>

After Baillie retired, Cruikshank<sup>2</sup> arranged to continue the teaching with the assistance of his son-in-law, Leigh Thomas, afterwards president of the College of Surgeons, and of James Wilson, one of Hunter's last pupils. But he died suddenly in 1800. Wilson, who is referred to by the late Sir Benjamin Brodie<sup>3</sup> as "*facile princeps* among the London anatomists of that day," became virtually head of the school.

Baillie, in 1802, had intimated to Glasgow University that he was now ready to give up the museum to that institution whenever it had a building fit to receive it. In the meantime Wilson had the use of the collection, and knowing that he was soon to lose it, he made most strenuous efforts to make a substitute for it, in which he was most successful.

In 1807 the building was pronounced ready, and the transfer<sup>4</sup> of the collection began. It was two years after before it was fairly settled in Glasgow.

<sup>1</sup> *Introd. Lectures*, p. 73.

<sup>2</sup> After Hunter's death Cruikshank made a collection for himself, largely with the assistance of Wilson, which, on his death, was bought by the Russian Government and taken to St. Petersburg. A few of the preparations are figured in Baillie's *Engravings*.

<sup>3</sup> Thomson's *Life of Cullen*, p. 741, note x.

<sup>4</sup> It was sent from London by sea.



The subsequent history of William Hunter's school of anatomy may be told briefly, although it deserves a longer notice than can be given here.<sup>1</sup> Leigh Thomas soon retired, and was succeeded by Benjamin Brodie. Under Wilson and Brodie the traditions of the school were worthily maintained. Many rival schools had sprung up, but it still retained its place as the leading one. One of these had more pupils, according to Brodie, because the lectures there were more suited to the capacity of the average student; Wilson's were on too high a scientific plane for them.

In 1808 Wilson bought out Baillie for £4000, believing that the College of Physicians intended to take over the school. They did not, however, and in 1812 Wilson, to get rid of some of the responsibilities he had undertaken, resolved to sell the school. Brodie could not afford to buy it, nor did he care for so large a venture, and it was sold to Sir Charles Bell. The purchase included Wilson's collection, which was incorporated with that of the purchaser.

Brodie continued to lecture in surgery for some years, then the lectures in that subject were given by John Shaw, Bell's brother-in-law. Wilson having reserved the right of lecturing, the anatomy lectures were divided between him and Bell (the latter giving the greater number) till his death in 1821. Four years later, Bell sold his whole collection to the Royal College of Surgeons of Edinburgh, of whose museum it forms the foundation; and in 1826, he accepted the chair of anatomy in the New London University (now University College).

The Great Windmill Street School was carried on for a few years longer by Herbert Mayo, Caesar Hawkins, and others. In 1830 King's College was opened, and Mayo accepted the chair of anatomy there. The building being not quite fit for the teaching of anatomy, he continued to conduct his class in the old school. During 1831, most of his collection and apparatus was transferred to King's College.

The era of the private schools of anatomy was drawing to a close, and that of the greater schools in the colleges and large hospitals had commenced. The Great Windmill Street School was finally closed about 1833. It had done its work.

It is to be feared that the museum in Glasgow University was not

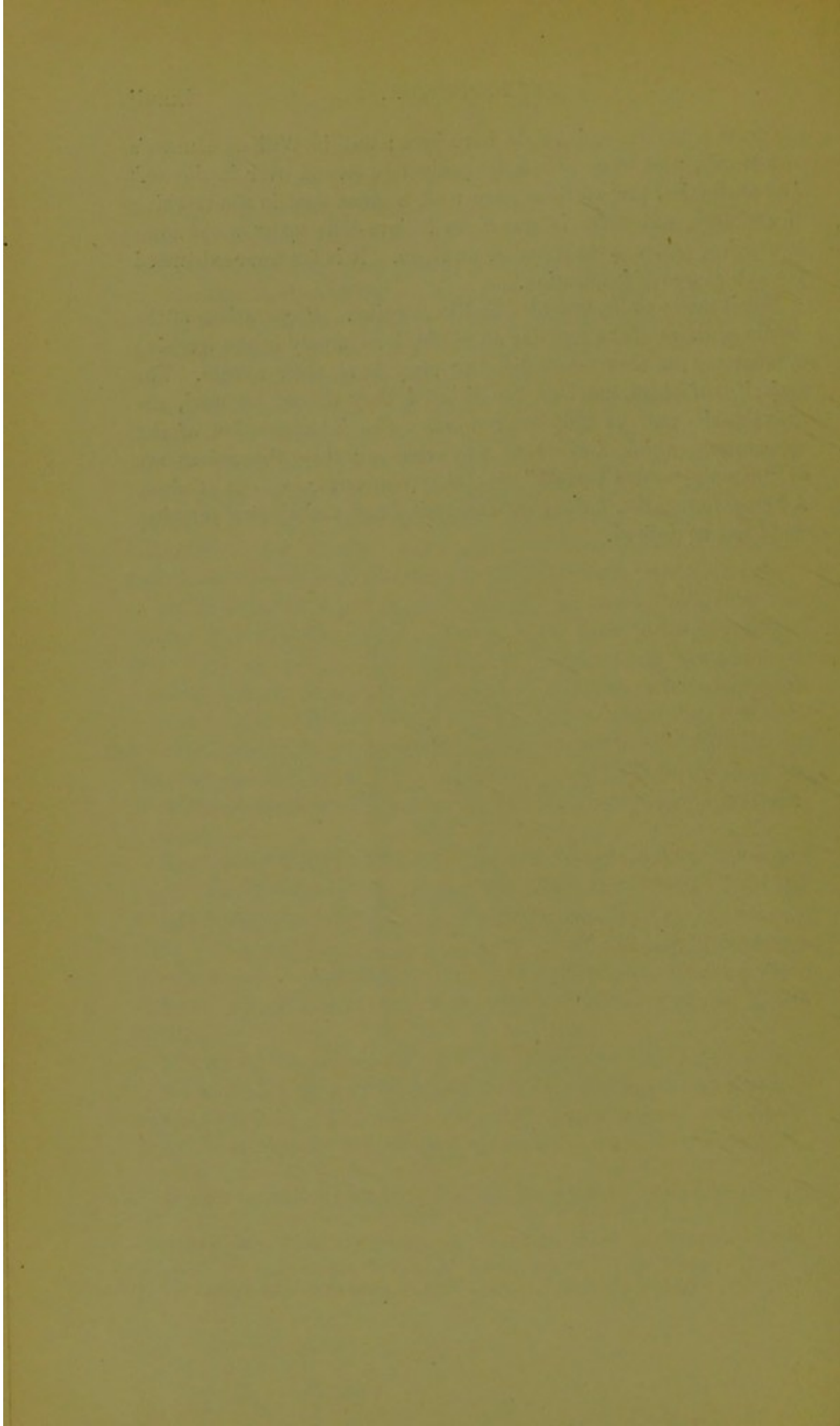
<sup>1</sup> *Vide* Letter of the late Sir Benjamin Brodie in vol. ii. of Thomson's *Cullen*, note x., p. 739, *re* the Windmill Street School of Anatomy; also Mr. D'Arcy Power's article in the *Brit. Med. Jour.*, 1895, ii., p. 1388.



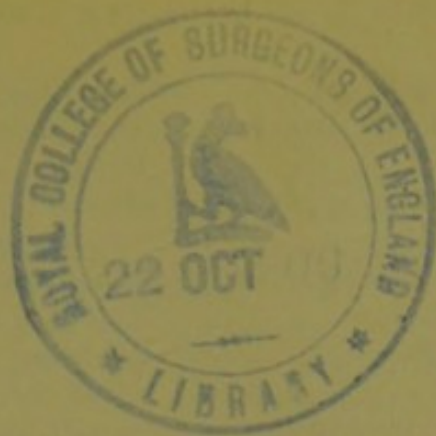
put to as much use as it might have been ; but, in William Hunter's own words, "let what cannot be praised be passed over in silence." The anatomical preparations were used a great deal in the teaching of anatomy, and there is reason to believe that many well-known anatomical plates were founded on them. It is far from exhausted yet as a source of inspiration.

But it needs to be extended and kept going. Preparations of the nature of those of the founder do not bulk so largely in the teaching of anatomy as they once did, but they have their sphere. The majority of them, used as he directed they should be used, are as valuable now as they ever were. The interpretation of the appearances which they show may change ; they themselves are so "exactly nature herself" that they can never get out of date. A better foundation for a great anatomical and pathological museum could not be desired.









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