The Hunterian oration for the year 1907 : being the sixty-third Hunterian oration since its foundation : delivered in the theatre of the Royal College of Surgeons : On the objects of Hunter's life and the manner in which he accomplished them / by Henry T. Butlin.

THE HUNTERIAN ORATION

FOR THE YEAR 1907

BEING THE SIXTY-THIRD HUNTERIAN ORATION
SINCE ITS FOUNDATION

Delivered in the Theatre of the Royal College of Surgeons

BY

HENRY T. BUTLIN, F.R.C.S., D.C.L.

ON

THE OBJECTS OF HUNTER'S LIFE AND
THE MANNER IN WHICH HE ACCOMPLISHED THEM

With the Compliments of the Hunterian Orator.

London
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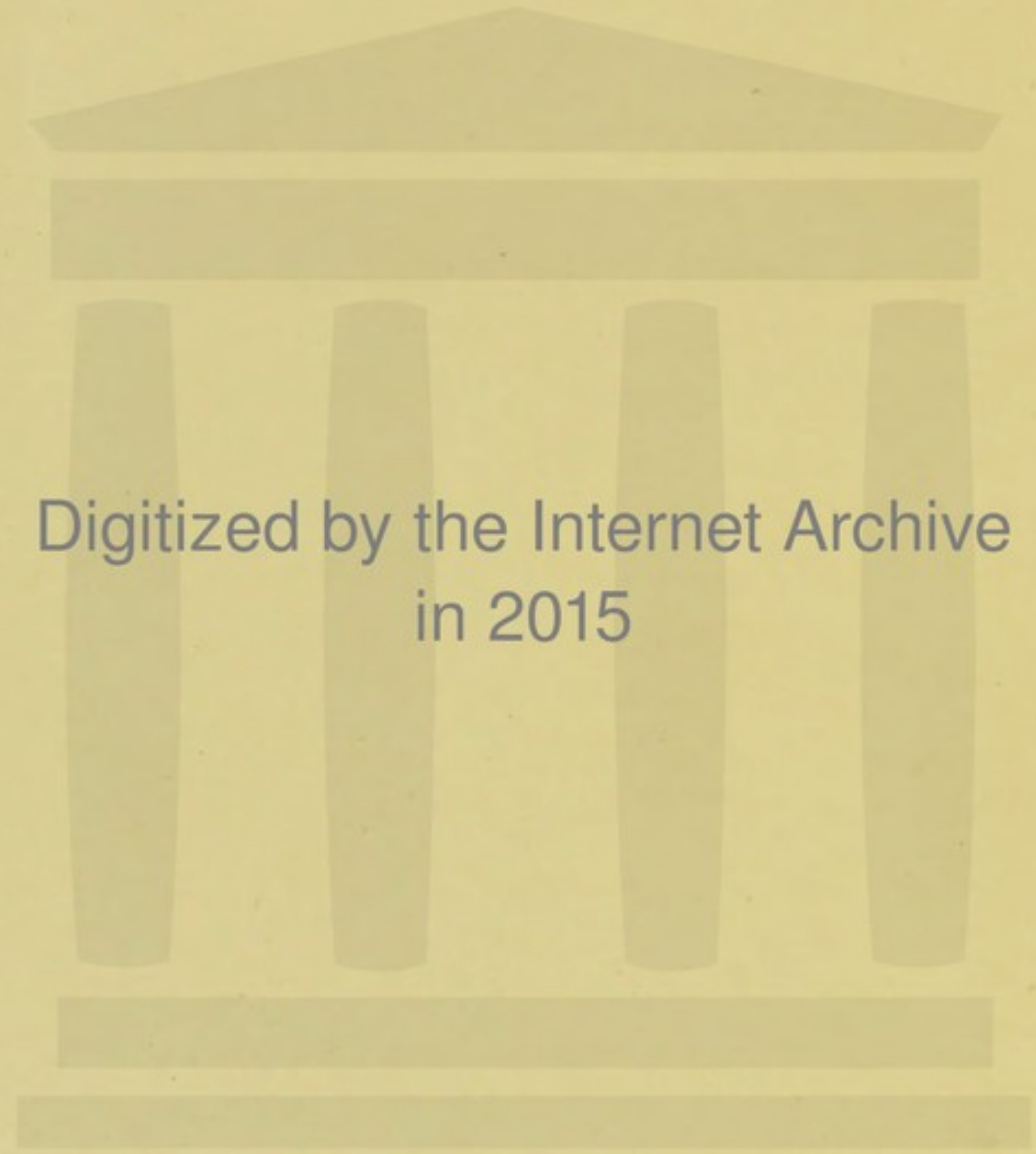
"such Oration to be expressive of the merits in Comparative Anatomy, Physiology and Surgery, not only of John Hunter, but also of all such persons, as should be from time to time deceased, whose labours have contributed to the improvement or extension of Surgical Science."—*Extract from the terms of the Trust.*



THE HUNTERIAN ORATION

FOR THE YEAR 1907

Mr. President, Ladies, and Gentlemen,

There is only one Fellow of the College to whom I need refer in the obituary which is associated with this lecture, but I should be very sorry to omit all mention of his name. Christopher Heath was a very active and useful member of the Council of the College for many years, and became its President in 1895. In 1897 he delivered the Hunterian oration. His books on 'Practical Anatomy' and 'Minor Surgery' early gained for him a reputation as a teacher, and he retained that reputation throughout his career at University College Hospital. Indeed, he added to it by the directness of his speech and the clearness of his views. I believe he would have attained greater success as a surgeon had he belonged wholly to the pre- or the post-antiseptic period. But coming, as he did, between the two he found it difficult to adapt himself to the altered conditions which the vast change of thought and practice imposed on our profession.

Even as it was, he was justly regarded as a leader of surgery in this town, and as one of the boldest operators of his day. Those of us who knew him well miss his fine presence and his cheery manner, while the vigour of his speech was always pleasing to us, whether he was on our side or in opposition to our views.

Human beings may fairly be divided into three classes in their relation to the affairs of this world. First are they who see that a thing is wrong; they are very numerous, especially in their relation to politics, and their opinion is in these days frequently referred to as the opinion of "the man in the street." Next are they who see how what is wrong should be put right. They are not so numerous as those of the first class, and for one who sees clearly there are at least many hundreds who only dimly see. And of those who see clearly few are capable of putting the wrong thing right. Few of them, indeed, have the inclination to do so, and of those few still fewer are capable of doing so; they are for the most part talkers, not workers. And third are they who set to work, diligently and with determination, to correct the wrong. They are not necessarily the persons who first discerned the wrong or who saw clearly the means by which the wrong might be corrected. Sometimes, indeed, they are merely workers, what are termed "humble instruments," but the work which they accomplish in this world and for the good of man is greater than words can tell.

I am going to give a short sketch of the life of a man who saw, long before the men of his time, that there was something seriously wrong with surgery, who saw clearly what was needed to correct the wrong; and who, in the prime of manhood, resolutely set himself the task of doing all that he could to set the wrong right, and continued to pursue that object for the remainder of his life, to the impairment of his health and to the expenditure of his fortune.

In most of the Hunterian orations which I have read or to which I have listened it has been taken for granted that Hunter's aims and objects were already familiar to the audience, and particular parts of his work and character have been dealt with. I might have taken a similar course; but a year ago, when my colleagues on the Council of the College did me the honour of appointing me Hunterian orator for 1907, I found myself so very ignorant of what Hunter wished to do and of what he actually did that I thought it would be grateful to my audience, as it would have been to me in some past Hunterian oration, if I dealt rather with the great scheme of Hunter's life and with the means which he took to accomplish it.

I have no doubt I ought to have known better, but I confess I had an impression, which was probably derived from conversation, from desultory reading, and from these orations, that surgery before the time of Hunter was in a deplorable con-

dition, and that it was immediately and at once raised from that condition by the influence which Hunter's work effected, particularly by one or two brilliant achievements on which much stress has been laid, and which were the result of the application of principles which had not hitherto been recognised, or at least applied to surgery. In order to discover how far this impression was correct I took some pains to make myself acquainted with the condition of surgery in Europe during the latter half of the eighteenth century and to compare it with the surgery of the first half of the nineteenth century. I was speedily disillusioned in regard to the first part of my impression. There were not only good, but brilliant surgeons in the great European countries, such as Sharp and Pott in England, Desault in France, and Richter in Germany, who treated accidents and surgical diseases and performed operations of many kinds with sagacity and skill, and who carried their patients through to recovery in a manner of which the nineteenth century might well have been proud. They taught well and wrote well. Indeed, I was so much impressed by their writings that I would venture to recommend the perusal of them to all those who, like myself, might be disposed to underrate the surgery of the period. They display considerable knowledge of the diseases with which they deal, a patience and care in treatment which would do credit to any age, and a desire rather to avoid than

to rush into operation, which might well serve as an example to the present day. And many of them are admirable for their style and language; indeed, the works of Mr. Pott have seldom been surpassed in surgical literature for purity of language and excellence of style. These men, and other surgeons of their time, taught good surgery, and further insisted on the importance of the practical study of anatomy as a basis for surgery, with the result that the general practice of surgery in the capitals and great towns of the European kingdoms was far more advanced than I could have believed possible. So much so that it is probable there were many persons, medical and lay, who would have been ready to affirm that surgery had reached its zenith, and that little could be done to improve it beyond what the observation and experience of succeeding generations might provide.

But when one looks more deeply into the question it soon becomes evident that there was a lack of knowledge on many matters which we now regard as essential to the proper practice of our art. The structure of organs, their vital relation to one another, their necessity or otherwise in the economy, their functions, and the manner in which their functions are performed, were for the most part matters of conjecture; the changes which they undergo in health and at different periods of life, and the variations which they may exhibit within the limits of health, were held of small account;

while the changes which they undergo in disease or as the result of accident were scarcely studied, for few people seem to have thought them worthy of serious study. In truth, the only scientific basis of surgery in that period was anatomy, and anatomy was studied rather for its direct service to the individual surgeon than with the belief that it might prove of great use to the art if it were studied from a wider point of view. Biology, physiology, physics, chemistry, and pathology had no place in the education of the surgeon, and those few persons who ventured—as some advanced thinkers did—to maintain that a knowledge of physiology and pathology was desirable in a medical man were for the most part treated with contempt, or were left to preach unheeded.

In truth, the surgery of that period was composed of a vast, unwieldy mass of observation and experience, balanced on a single point, the study of anatomy; it was like some great logan-stone, which even the weakest force might rock and a violent shock might overthrow. No wonder if, in these circumstances, opinion on vital questions wavered. No wonder if methods of treatment which had been discovered or invented long before, and which have since been employed with the greatest benefit to mankind, such as Ambroise Paré's ligature of vessels, fell into disuse, or were discredited from ignorance of the processes by which they were accompanied and on which their success depended. No wonder if

surgeons shrank from dealing with organs of the structure and functions of which they knew so little, or feared to apply measures the effect of which they could only dimly imagine. Surgery in the eighteenth century may fitly be compared with navigation before the use of the compass. The mariners of those days went down to the sea in ships and accomplished voyages, often difficult and dangerous, under the guidance of the stars by night and of well-known marks by day. They carried them through, not once, but again and again, successfully, and with a marvellous confidence begotten of experience and observation. So did the surgeon, guided by similar observation and experience, carry his patients through sickness and operation so often and so surely that he may well have felt that there could be no better guides than he and his fathers before him were accustomed to rely on. But, as the great open seas and oceans were inaccessible to the sailor until he had acquired the compass, so was surgery restricted within certain narrow limits by the lack of that scientific basis on which it now reposes. And so it might have remained, and we might still be in the condition of our forefathers had not an event occurred which attracted no attention at the moment and on which, if it had been noticed, no hope would have been placed. For in the year 1748 a young man arrived in London from the North and became assistant in the dissecting-room of his distinguished brother, a post which he seems

himself to have solicited. He was just twenty years of age, and his record thus far was certainly not of such a character to encourage great expectations for his future. His education seems to have been neglected, for he had shown no inclination to studies, to which his mother does not appear to have forced him. He had spent most of his time in country sports, and the only attempt at industry which he seems to have made was to help his brother-in-law, the cabinet-maker, out of his difficulties, an attempt which had been a failure. For the rest, he was rough in his manners, rather disposed to coarse than to refined society, and quite as inclined to loose habits as other young men of his age and of his time. I suppose Dr. William Hunter must have recognised that his brother John had good abilities, but how he would use them, or, indeed, whether he would use them at all, was a matter of conjecture, so that his appointment to the post of assistant in the dissecting-room was quite an experiment. No one of his family or of his friends would have been the least surprised if he had, within a few months, or even weeks, broken his engagement and betaken himself back to Long Calderwood, whence he came. And certainly no person at that time would have ventured to predict that "Jack Hunter" would not only display a life-long industry such as has seldom been exceeded, but would leave behind him a reputation which we to-day, one hundred and fourteen years after his death, celebrate with that fervour which is

born of our conviction of his value to the art of surgery, and, as a natural corollary, to the human race.

There are few better examples of the moulding of a man's character and future by external circumstances than the history of Hunter's life affords. This rough and ill-shaped peg found the hole which it exactly fitted. From the moment he took the dissecting scalpel and forceps in his hand he began to work with pleasure. Nor was it the mere manual dexterity which his employment demanded which satisfied his spirit, although there can be no doubt that the use of his hands in skilled labour afforded him a satisfaction which continued to the end of his life. Anatomy itself attracted him, and he threw himself into the study of it with such success that, within a few months, he had acquired sufficient knowledge to enable him to direct the pupils of William Hunter's school. Many a young man might have gone thus far and there remained, content with the occupation for a livelihood and for the pleasure it gave him. Happily, Hunter's ambition urged him to become a surgeon, and within a year of his arrival in London he began to attend the Chelsea Hospital. It is not needful to follow his progress closely during the next few years, or to discuss the reasons why he went to Oxford or why he came away again so speedily. It suffices to tell that, whether he was studying at the Chelsea Hospital, or at St. Bartholomew's, or at St. George's, he seems to have spent all the time he could in the dissecting room.

He dissected, injected the vessels by methods which had been recently invented, mounted specimens, and thus acquired skill in anatomy and, quite as important in his case, the love of collecting, which, like the love of money, seems to advance with age and to increase with what it feeds on until it becomes a greed. His first discovery in anatomy, so far as history has handed it down to us, was in 1754, when he solved the problem of the mode of connection between the placenta and the uterus, and in 1758 he instituted a set of experiments for the purpose of ascertaining whether veins possess the power of absorbing. So that we find him, at the age of thirty years, a qualified surgeon with a strong bias towards the scientific side of his profession and with an inquiring and original mind which incited him to discover facts, hitherto unknown, by careful observation and experiment. He was just beginning to study comparative anatomy in the same way in which he worked at human anatomy when a misfortune occurred which menaced his whole career, if not his life, for he fell ill of inflammation of the lungs and was threatened with consumption, and by-and-bye was forced to leave London. He became a military surgeon and might have drifted into the condition of the men painted by Smollett and Lever. But by this time he had become a serious man, and the forcing of his attention on sick and wounded men, which his military service imposed upon him, had a great effect upon his mind. It impressed him

with an interest in the maladies of human beings which never again left him, and which directed his scientific investigations to the elucidation of the problems of health and disease. Even when heavily occupied in the Peninsula he found time to conduct certain experiments in physiology; and the experience he gained in gun-shot wounds, and the observations which he made upon them, formed the foundation of his later work on gun-shot wounds and inflammation.

On his return to London, in 1763, his place in his brother's school was filled; he had no regular employment, no certain means of subsistence, and before him lay a hard struggle, for he settled down to push his way in London as a surgeon. It was no rosy path, and, in his case, there was no sudden jump into success, but a hard fight for everything which he obtained, and a fight which had to be continued during many years. It is always interesting to follow the progress to success of a young man in these circumstances, particularly when, as in the case of Hunter, there were special difficulties to overcome. But, to us, this period offers a much deeper interest, for it is undoubtedly the period when the great work of his life gradually unfolded itself in his mind. There can be no doubt that he had seen for a long time past that surgery rested on a very frail foundation, and that it would be impossible to carry it much farther forwards or even to practise it with confidence so long as it had

no firmer basis. He rightly judged that they who treat diseased bodies should have an intimate acquaintance with the structure and functions of those bodies in health; that they should know, so far as such knowledge is possible, the changes which those bodies undergo in the progress of disease, and the further changes which they undergo in the progress towards recovery. He perceived that each part and organ of the body must be studied not only by itself but in its relation to all other parts; and he had already come to the conclusion that great light might be thrown upon these matters by a study of similar parts in animals, from the highest to the lowest; for a knowledge of comparative anatomy would not only suggest the meaning of what might otherwise be regarded as meaningless or useless anomalies in man, but would furnish a much better criterion of the relative value of the various organs, and of the parts of organs, than could be acquired from their study solely in the human subject. It would be possible, too, to observe on animals the effects of injury and disease which had been deliberately produced, and, perhaps, to obtain a much clearer notion of the effect of treatment than could be obtained in man. But at that time there was no material, either in this country or in any other, from which the information Hunter required could be obtained; and, if he was to acquire the information, he must first provide himself with the material—a labour in itself so costly and gigantic that I can scarce con-

ceive that even his ambitious and determined spirit could, directly upon his return to London, and in the condition in which he then found himself, have seriously entertained it in the manner and to the extent he afterwards succeeded in carrying it through. I can only suppose that the idea gradually took root in his mind and expanded as he worked, and that his range of observation became wider as each step led him further on and increased facilities of obtaining material presented themselves. It does, however, seem quite certain that, soon after his return to London, he began, though probably in a very small way. He collected specimens, dissected and prepared them, and, fortunately, preserved them. He studied them closely, compared them, recorded his observations on them, formed opinions on them, tested his observations and opinions by experiment, of which he was a master, both in the ingenuity with which he designed the experiment and in the skill with which he carried it out. He produced pathological conditions in animals by various means and studied them closely before and after death. He made post-mortem examinations* on persons who died under his care, or whom he had seen in consultation, and kept careful records of them; and for the next thirty years of his life he continued this

* *Post-mortem examinations.*—"Q. You have long been in the habit of dissecting human subjects; I presume you have dissected more than any man in Europe? A. I have dissected some thousands during these thirty-three years."—Hunter's evidence at the trial of Donellan for the murder of Sir Theodosius Boughton. Ottley's Life in Palmer's 'Works of Hunter,' vol. i, p. 194, 1839.

work, which was never interrupted, save by illness. His collection grew, slowly at first, then more quickly, until he was obliged to make a place for it at Earl's Court, where he bought land and built a house. At a later period he acquired a site in Leicester Square and built a museum, in which he placed those preparations which could be kept in London.

Many of my predecessors have dwelt on Hunter's industry and capacity and on the vast amount of work which he accomplished. But mere language is impotent to give even an idea of this. The only means by which I can exhibit to you his labours and the working of his mind is to demonstrate some portion of his work. For that purpose let us take the preparations of the intestinal canal, from the stomach to the end of the large intestine. Here it is in the articulata, in the mollusca, in the fish, in the reptile, in the bird, and in the mammal, and, finally, in the highest of all mammals—in man. I have selected a characteristic specimen from each of the great orders which are represented in the museum. But I might have brought here from the articulata alone examples of the intestinal canal of eleven species, all collected by Mr. Hunter. The sea-mouse, the fly, the cicada, the dragon-fly, the termite, the bee, the cockchafer, the cockroach, the locust, the scorpion, and the cirripede are all represented on the shelves. There are specimens from nine different species of molluscs, from thirteen species of fish, from seven species of reptile, from eight kinds of bird, and from

fourteen sorts of mammal. Some of the more interesting species furnish more than one specimen: the sturgeon, amongst fish, furnishes no fewer than nine, and the ostrich, amongst birds, twelve specimens, whilst the intestinal canal of man is of such interest that there are Hunterian specimens taken from white men, from black men, and from the unborn child. Many of these specimens are beautifully prepared and mounted, and the injected specimens are a wonder in themselves. Of course, Mr. Hunter had good assistance, but it is nevertheless certain that a very large number of the specimens were dissected, injected, and set up by himself. At the end of one hundred and twenty years most of them are in an admirable state of preservation and still show quite well what they were designed to show at the time they were put up.

Some collectors are content with the mere pleasure of collecting, with counting their treasures, and with seeing their collections increase. It was not so with Hunter. It is at once apparent that most of these preparations were the objects of long and special study. The description so frequently contains some observation over and above that which would have been sufficient for even an elaborate label. Thus the note to No. 629, which contains the alimentary canal of a mullet, says: "The intestine, after communicating at its commencement with the cæcal appendages, is convoluted in a peculiarly regular and concentric manner, forming a mass of a triangular

form, adapted to the shape of the abdominal cavity and affording an example of proportionately the

FIG. 1.

No. 629.—Mugil capito. Two thirds natural size.

longest and, in its disposition, the most complex intestinal canal of any of the class." The descrip-

tion contains a comparison and suggests a wide range of study and an intimate knowledge on the part of the author, not only with the anatomy of this particular fish but with that of fishes generally. It is the same with No. 655 (intestine of a lizard) and with No. 712 (a portion of the intestine of a whale). The description of the former tells how "the mesentery in this tribe of animals may be observed to be very simple; the intestine carries it forward immediately beyond the pylorus and runs along its right edge till it becomes colon or rectum"; while the latter specimen is one of those from which Hunter drew up his account of the anatomy of the whale tribe, and is used as an example of the differences which are to be observed in the intestinal canals of the bottle-nose, the piked whale, the porpoise, etc.

Ofttimes his study and observation of a preparation induced him to experiment. This bottle contains the dissected alimentary canal of a large fly. It is an admirable specimen, well prepared and mounted. The organs of digestion, to quote the words of Hunter, "are attended with a crop." It is possible that other persons were aware of this and had wondered why. But Hunter is not content with wondering; he must *know* whether the crop is a mere receptacle for food or whether it performs a function in digestion. And he tells us how he proved to his satisfaction that it is only a receptacle. He says:

"I kept some of these flies fasting for some time;

I then gave them milk, which they drank readily, and when I thought they had filled their bellies I put them into spirits which assisted in coagulating the milk wherever it might be. On opening the abdomen I found this bag full of curd and whey, as also some in the stomach. That I might be still more certain that this bag was a reservoir only, and

FIG. 2.

No. 596.—Helophilus pendulus. Life-size.

that it had no other business in digestion, and that therefore food would be taken into the stomach immediately, if immediately wanted, I repeated the above experiment, with this difference—the milk was now coloured with cochineal; I not only found the bag full but the stomach and intestines, so that the food when wanted was immediately carried into the stomach. I kept a fly for twelve hours without food and then gave it milk and killed it and found

no milk in the crop, but it had got through almost the whole tract of intestines: here the animal had immediate occasion for food, therefore the milk did not go into the crop." (MSS.)

No fewer than three sets of experiments to discover the use of a tiny receptacle attached to the alimentary canal of a fly, a receptacle so insignificant that it might well have escaped the notice of even a tolerably skilled observer. These are only examples of hundreds or even thousands of experiments, undertaken on animals and plants, at all seasons of the year, under favourable and unfavourable conditions, and at all times of the day and night, if the experiment seemed to be as needful at night as in the daytime. The experiments were repeated, modified, varied, according as doubts arose in the mind of the experimenter of their correctness and whether they sufficed to prove his case. For no man knew better than Hunter the fallacies to which experiments are liable and the caution which should be exercised in deducing conclusions from them.*

From the structure and functions of the intestines we come to their diseases. Here are Hunterian specimens, taken, for the most part, from the human subject, but not necessarily so. For one of these few is taken from an ox, another from an ass. They

* *Experiments.*—"I apprehend a great deal depends upon the mode of experiment; no man is fit to make one but those who have made many, and paid considerable attention to all the circumstances that relate to experiments."—Hunter's evidence at the trial of Donellan for the murder of Sir Theodosius Boughton. Ottley's Life, Palmer's 'Works of Hunter,' vol, i, p. 195, 1839.

exhibit the effects of inflammation of the peritoneal covering and of the various coats of the intestines; they show tubercle, hydatids, ulcers, and the effects of accident. Some of them form the material for papers and theses; and there were many pages of manuscript notes upon them. The notes afford a wonderful insight into the incessantly inquiring nature of Mr. Hunter's mind. They abound in "queries." Thus, of this specimen (No. 2336) he observes that the coagulable lymph which glues the intestines together is extremely vascular and there immediately occurs the question, "How are these vessels formed? Are they elongations of the exhaling vessels forming arteries?" Again, of specimen 2434, which was taken from the body of an officer who died from a bullet-wound received in a duel in the ring in Hyde Park, there is a long account of the symptoms which followed on the injury, and of the manner of the patient's death, with a full description of the appearances at the examination. Mr. Hunter adds:

"This case admits of several observations and queries. First, the lowness and gradual sinking with the vomiting without blood bespoke wounded intestines, and those pretty high up. It shows how ready Nature is to secure all unnatural passages, according to the necessity. Query, what could be the cause of his having no stool, even from a clyster? Were the intestines inclinable to be quiet under such circumstances? Would he not have lived if

the immediate mischief had not been too much? I think that if the immediate cause of death had not been so violent Nature would have secured the parts from the secondary—viz. the extravasation of the fæces. What is the best practice where it is supposed an intestine may be wounded? I should suppose the very best practice would be to be quiet and do nothing, except bleeding, which in cases of wounded intestines is seldom necessary."

Specimen 2471 was taken from the body of the Right Honourable the Earl of Bristol. There is a detailed account of the examination, and there occurs a partial answer to a question which had probably been in Hunter's mind for a long time past. He says:

"The gall-bladder was very small, containing no bile, but a transparent slimy mucus. A small gall-stone lay in the beginning of its duct, which obstructed the passage of bile into it. This would hint as if the gall-bladder did not secrete bile."

The few specimens I have shown were not selected on account of their especial value or because they had apparently been objects of extra solicitude and study on the part of Mr. Hunter, but almost for the opposite reason. Indeed, I happened to light on this part of the museum first, and they seemed to me to illustrate so well his ordinary daily work and the method of it. They and the notes which are appended to them exhibit aptly the great qualities of Hunter's mind: observation, comparison, reason-

ing, infinite patience, reluctance to form too hasty a conclusion, and that best form of curiosity to which we give the name "seeking after knowledge," which *must* receive an answer and will not rest until it is supplied. These few specimens and the work connected with them would suffice to have made the reputation of a man of science. They form but a drop in the ocean of Hunter's work. Multiply them several hundred times. Multiply the observations, the queries, the experiments in the same proportion, and an idea may then be obtained of the vast amount of work accomplished by Mr. Hunter. Almost all the organs of the body are treated in the same fashion, the organs of the circulation, of respiration, of locomotion, of digestion, of secretion and excretion, of the general and special senses, in all kinds of animals, under conditions of health and of disease.

Take the comparative anatomy of the integuments as it is exhibited in the Hunterian specimens alone and you will find enough to occupy you for many days and to interest you for many weeks. The varieties of skin in various animals, the tissues which take the place of skin in some animals, the shedding of the skin in serpents, the shedding of the shell in certain fish, the transition from nails to claws, from scattered hairs to fur and feathers, all these things are exhibited as if there had never been any other investigation in the collector's mind. And all parts of the body which were dealt with

seem to have received a like meed of attention and to have been the objects of similar study.

To those who are interested in estimating the amount of work which can be accomplished by one man in the course of thirty years I would recommend, in addition to a study of the Hunterian specimens in the museum, a careful perusal of the descriptions and notes in the catalogues, and to read the published works, and Palmer's 'Life of Hunter,'* and to take into account how much of his written work depends on hundreds and thousands of observations and experiments, many of which are, so to speak, only casually referred to in the text. And all this was accomplished by a man who was not by nature disposed to withdraw himself from the amusements and occupations pleasing to other active men; who was neither a recluse nor an ascetic; whose early life had been a life of idleness, spent for the most part in out-of-door pursuits; and who for thirty years before his death was engaged in active and fatiguing hospital and private practice as a surgeon. As a young man he was vigorous and headstrong, and during his whole life he remained irritable and passionate, and could brook neither interruption nor contradiction. And during the last eight years of his life he suffered from advancing ill-health, which caused him much suffering and

* *Palmer's 'Life of Hunter.'*—I used the expression "Palmer's Life of Hunter" because Palmer's 'Works of John Hunter' is so well known. But the 'Life' was written for Palmer's edition of the 'Works of Hunter' by Drewry Ottley, not by Palmer himself.

increased the natural irritability of his temper. Think, therefore, what restraint he must have put upon himself, and what it must have cost him to withdraw himself gradually from every kind of pleasure save that which he derived from his collection, and to devote himself to his work, summer and winter, from early morning till late at night, in good health and in bad health, year after year for all those years. Surely there are few more striking examples in the history of human beings of indomitable pluck and perseverance!

From the year 1785 Hunter's health was broken, and he was perfectly aware that his life might be cut short at any moment. Yet there was still so much to be done, and he must still work hard at his profession, for he must find money to spend on maintaining and improving his collection. He suffered from anxiety, too, because he had not completed his great work on inflammation, which embodied a large part of the experience of his life, and because the catalogue of his museum was very backward, and he was conscious that the collection would lose much of its value if it were not properly catalogued. He gave up a good deal of his time during the last four or five years to these two objects, and was still occupied with them when the end came suddenly, as he had long foreseen. On October 16th, 1793, he was extremely excited and annoyed by certain observations which were made in the course of a meeting in the board-room of

St. George's Hospital. He was seized with a violent attack of angina, was conveyed into an adjoining room, where within an hour he expired. Not only had he worked while it was day, but he had worked up to the last moment of his life. The night had fallen and John Hunter could work no more. Thus in a moment of passion passed the spirit of a great man, and there were as yet few persons who were conscious that he was a great man, and scarcely anyone who realised how great a man he was. Few persons followed him to his tomb. There was no public funeral. No subscription was raised, either by his profession or by the public, to commemorate his memory or to relieve the pressing needs of his widow and her two children.* Yet they badly wanted help, for, after Hunter's debts had been paid, there remained really nothing for their maintenance.

* *Mrs. Hunter.*—I often think the wives of men of genius are to be pitied. Many of them have to put up with neglect, which is perhaps not intentional, but due to the fact that the husband's mind is too devoted to his pursuits to allow him either time or inclination to devote himself to his family. One need only recall the hard lot of the wife of Palissy and of the wife of Arkright, both of whom have been handed down to posterity as women who were incapable of appreciating the genius of their husbands. Poor Madame Palissy had to put up with many years of anxiety and hardship, which amounted almost to the starvation of herself and of her family. And, during the greater part of that time, she was aware that her husband, far from being the object of respect and honour to his townspeople, was looked upon by them as a poor silly fool, who neglected his business and brought his family to destitution and debt by a vain attempt to carry out a work for which he had no means and no special aptitude. And Arkright's wife was separated from him for almost similar reasons, and because she could not endure the sight of her husband in rags, and her own poverty, when she

To many persons at this time Hunter's life must have appeared to be a gigantic failure. He had written books and papers which few people cared to read and fewer still could understand. He had been so poor a teacher that, while Desault in Paris gathered round him 400 students, Hunter's class seldom numbered more than twenty. He had spent all his spare time and ruined his health in making a collection which he declared had cost him £70,000, and no one thought it worth the having. Although he was regarded for some years as the first surgeon in London, his position had not been recognised by the State. Indeed, many members of his own profession regarded him with distrust; they thought him too subject to fancies and theories; he was changeable

knew him to be capable of keeping her and himself in comfort, if he only chose to apply himself to the work which properly belonged to him.

In the same manner, Mrs. Hunter must have been aware that her own life might have been much happier if her husband had been less devoted to his scientific studies, and she was probably equally conscious of the fact that she and her children would be without means after Mr. Hunter's death, for his spare income was applied to the needs of his museum. Nor could it have been an easy matter to live with a man of so irritable and passionate a disposition as her husband.

Nevertheless, she proved herself, in many respects, worthy of the position she had accepted. After Hunter's death she became companion to two young ladies, and continued in that humble position until her death. She appears to have had a profound belief in the genius of her husband, for, some time after his death, she was anxious to erect a monument to his memory in Westminster Abbey, but the fees demanded for permission to occupy a niche there were too extravagant for her reduced condition, and she was forced to abandon the idea. To my mind she deserves more notice than has been taken of her, both for her own abilities and for her devotion to her husband during his life and after his death.

in his methods and ideas, and did not seem to have made up his mind whether to treat an inflamed part with hot applications or cold lotions, and to the last was undecided whether the best treatment for gangrene was wine and bark. He had enjoyed for many years a considerable income, and had left his family in destitution. Nor was the opinion of his foreign contemporaries more flattering. Richter declared that Hunter had the art of enveloping useful practical subjects in mere theoretical foam, so that they became quite unintelligible, and might easily be regarded as something new. Hebenstreit, who translated his book, regretted his inclination to paradox. And Tode spoke of him as the English theory-smith.

An attempt was made to prevail on the Government to purchase his museum, and Mr. Pitt was approached for this purpose, but he would scarcely take the matter into consideration; nor can he be blamed for this decision. He was surrounded by difficulties, and had no money to spare for science. Even had the funds been available, he was not likely to have applied them to this purpose; for he appears to have consulted no less an authority than Sir Joseph Banks, the President of the Royal Society, on the value of the museum from a scientific point of view, and Sir Joseph Banks had expressed the opinion that the collection was not of sufficient importance to the general study of natural history, or, indeed, to any branch of science except to that

of medicine, to warrant its purchase by the State! Happily, Lord Auckland and some other distinguished persons took the matter up, and persisted with it until Parliament was persuaded to purchase it at a cost of £15,000. But this did not take place until 1799, six years after Hunter's death; and in the meantime the collection had been in danger of being suffered to fall into decay or of being dispersed. It cost money to maintain, and already some portions of it had been sold to defray current expenses. We are indebted to the timely help of Lord Auckland and his associates for having preserved it to the nation. Whether it was first offered to our sister college, as Ottley suggests, I do not know, but it is certain that in the course of the same year (1799) it was offered to our predecessors, the Corporation of Surgeons, and to its eternal credit, be it said, the trust was accepted on December 23rd by a unanimous vote of its Council. And to the glory of this College, be it further said, that one of the chief objects of generation after generation of our Councils has been, not merely to maintain the Hunterian Museum, but to enlarge and perfect it until, at this present moment, we, the present Council, can exhibit it proudly as the best museum of its kind in the whole world.

Many years elapsed before Hunter's fame became established, and it is not easy to trace the steps or the precise means by which this was effected. That it was accomplished slowly there can be no question.

The opening of the museum to the public must have had much to do with it, for those who visited it, among them foreigners of scientific distinction, soon began to appreciate its value. Hunter's works, particularly that on gun-shot wounds and inflammation, were more carefully studied, and those who read them could not fail to appreciate the genius of the author, even if they found them difficult to follow, and were not wholly in accordance with the opinions which were expressed in them. And there was yet another means. Although Mr. Hunter's class was always small, it contained a number of young men who afterwards became distinguished. Those of them who appreciated his teaching valued it so highly that his opinions and his name were ever in their mouths. To whatever cause or combination of causes we choose to attribute it, Hunter's renown rose slowly and steadily until the greatness of the man and his services to science were acknowledged in every civilised country in the world, and eighty years after his death the chief fault which Fischer,* the German author, could find in his favourite, Richter, was that he was not able to appreciate the worth of Hunter.

There is no machine with which to measure greatness; and if there were one it would have to be made in many different forms, for the qualities

* *Fischer.*—In 1876 George Fischer published his work on 'Chirurgie vor 100 Jahren.' Chapter X contains an excellent account of the Hunters, particularly of John Hunter.

and actions which go to make up the greatness of one man would so ill befit another, equally great in his own particular sphere, that the same mould could not be applied to both. There is, however, one test which is generally accepted as evidence of a great mind, whether it be the mind of a ruler, of a philosopher, of a poet, or of a man of science. It is that "deep things should be discovered to him out of darkness"; in other words, that he should see clearly truths which are still hidden to ordinary mortals. And on this test I venture to class Hunter as one of the greatest men that ever entered our profession. Not for the museum which he made, or for his discoveries in physiology and comparative anatomy, or for the wondrous example of industry and determination which he has bequeathed to us, and certainly not for the improvements which he actually introduced into the practice of surgery, although any of these things would have entitled him to a high place in our esteem, and all of them together would have placed him very high indeed; but because the true relation of surgery to science was revealed to him nearly 100 years before it was so clearly recognised by those who followed him that they were forced to act upon it.

For the first two generations after Hunter's death his memory was held in reverence on account of his wonderful collection, of his contributions to the knowledge of the processes of life in health and in disease, and of the manner in which he him-

self had applied his knowledge to the practice of surgery. His example served to stimulate a few young men to study physiology and pathology, and in consequence progress was made in both those subjects. It was only natural that those young men who had known him personally and had admired him should imitate him. A kind of "cult" of Hunter is said to have sprung up, and I have no doubt that some of his admirers imitated the roughness of his manner and the freedom of his speech more closely than they did his industry and perseverance. The chair in which Hunter had sat, and other of his personal belongings, were preserved, and still constitute the Hunterian relics which we guard with veneration. In 1819 a Hunterian society, which still flourishes, was founded in this town. All this was as it should be: it was done in admiration and respect of the life of a very distinguished man. But that life had as yet produced no fruit in its effect on medical education. The rank and file of the profession were little better educated than before, and even those men who occupied the higher walks of medicine and surgery were, with certain marked exceptions, for the most part no better than their predecessors in the time of Hunter. To some persons the foundation of surgery on science was but a happy thought; other persons did not greatly favour it; and to others, again, it was positively obnoxious. Within my own recollection, the "practical surgeon," who neither

knew nor cared for the scientific side of his profession, still existed. And it will scarcely be credited that one of the surgeons of my own school, illustrious at that time by the teaching and example of Sir James Paget, warned me not to devote too much attention to the study of pathology lest it should interfere with my prospects as a surgeon. Happily, during all those years the views of Hunter had never been lost sight of, and slowly fermented in the minds of the leaders of our profession until they found expression in the reform of medical education on lines which would have been approved by Hunter. It no longer sufficed that the student should be told by the best educated of his teachers that the foundation of medicine and surgery is science. He must himself acquire sufficient scientific knowledge to enable him to practise his profession with safety and success. One by one scientific subjects bearing on the study of disease were introduced into the medical curriculum, until, some ninety years after Hunter's death, those subjects in which he most delighted, and which he regarded as the basis of sound surgery—anatomy, physiology, biology, and pathology—formed a necessary part of the education of every medical student. Not only in this country and throughout Greater Britain is this the case, but it is the rule of all countries which are advanced in civilisation, and is carried so much farther in some of them that I am told that candidates for a degree in medicine in the

universities of Scandinavia are expected to graduate first in science. Thus the views of Hunter may be said to have found acceptance in all parts of the civilised world.

I venture to think that the founders of this oration (Dr. Matthew Baillie and Sir Everard Home) made one mistake in the conditions which they laid down. The oration ought to be delivered one time by a naturalist, another time by an anatomist, again by a physiologist, and only from time to time by one of us. By putting together the lectures delivered by these various specialists, and in that way alone, could a just appreciation of the genius of Hunter be obtained. But it has been otherwise ordained, and we act up to the letter of the law. It thus happens that, as is natural, Hunter's fame as a surgeon is largely the theme of these orations. And yet I regard it as the least of his claims to be handed down to posterity. That he was a good and sound surgeon and a sufficiently good operator I do not doubt, and he introduced several valuable improvements into the practice of surgery. But had his reputation rested on his achievements as a surgeon, he would have been handed down to us merely as one of many distinguished surgeons who have helped to advance in some degree the practice of their profession. I scarcely venture to propound such a heresy in this place, but I cannot but feel that had I been a surgical patient during the latter part of the eighteenth century, I would as lief have

been attended by Mr. Sharp of Guy's, or Mr. Pott of St. Bartholomew's, as by Mr. Hunter of St. George's. Not because he would have been likely to be thinking of some favourite research on which he happened to be engaged when he was by my bedside, for it was characteristic of him to concentrate all his attention on the matter directly before him, whatever it might be; but because he does not present himself to me as having been a genius in surgery like Paré, or, to come down to later times, like Astley Cooper or Dupuytren. He was such a surgeon as industry and application, with a liking for the work, and great shrewdness and powers of reasoning, might make of many a young man with a good eye and a steady hand. My only astonishment, as I read again and again the story of his life and labours, was that he ever found the time in all his multifarious pursuits to carry on the business of a large surgical practice and to rise to the first place as a surgeon in this town. To me it is only another marvel of his character and a sign of how he towered far above other men. It was the only means by which he could earn money, and money he must have for his scientific needs. So he stood manfully by the practice of surgery, and by directing all his attention to it while he followed it he became, as such a man needs must, the leader of it for the time being.

I have done, Sir, and this lecture must stand as my appreciation of the life of him whom I may

speak of as our patron saint. And now that I have delivered it, I am ashamed of it, for it seems so poor a tribute to his memory. I accepted the task not too willingly, for I felt that it was beyond my powers. But as this duty is laid on one or the other of us in turn, according to the terms of the trust, we strive to acquit ourselves, at least, in such a manner as shall not disgrace the College and the trust.

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