The Hunterian oration : delivered at the Royal College of Surgeons of England on the 14th February 1881 / by Luther Holden.

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DELIVERED AT THE

ROYAL COLLEGE OF SURGEONS OF ENGLAND

ON THE 14TH FEBRUARY 1881

BY

LUTHER HOLDEN

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THE

HUNTERIAN ORATION.

Mr. President, My Lords, and Gentlemen,—

"Let us now praise famous men and our fathers that begat us."

I can find no better than these venerable words wherewith to invite you to welcome the theme which brings us together here to-day; for, within these walls, nay, in any place on the earth where men of our profession are met, what man is famous if John Hunter be not famous? or, who but himself can be called the father of us English surgeons?

His fame is fixed too high for us ever to grow careless or weary of our theme; we do but honour to ourselves in thus bearing witness before the world that we honour him; and that we are all, however unworthy the best of us may seem to rank with him, his loyal disciples in self-devotion and the pursuit of truth.

Some natures, it is true, are disheartened by the contemplation of the great achievements of genius

which map out the history of our race: and, here and there, an indolent man may be found, who has buried his one talent because it was not ten. Though this temper of mind is, happily, rare in our profession, which daily brings us face to face with the painful aspects and emergencies of real life, still it is best that we should always keep before us these brilliant examples of successful genius. Without them, how self-satisfied might we not become in the possession of our small attainments! how remiss in their exercise! To the striving and earnest man they are full of encouragement; not only do they urge him on the path of common duty, but they raise him, as it were, on an eminence from which he may overlook the past, and, by seeing the results of the aspirations of his predecessors, assure himself of the reasonableness of his own.

No wonder, then, if the nobler side of our nature is moved to love and gratitude at the very mention of a name like that of John Hunter. No wonder, if every incident of his life is still rich with interest for us. No wonder, that the plodding historian finds his labour grow lighter and his narrative become more picturesque when Hunter crosses the stage. No wonder that, as English sailors are proud of Nelson, English soldiers of Wellington, English poets of Shakespeare, English physicians of Harvey, so English surgeons are proud of Hunter. No wonder that it is held an honour to stand where I stand to-day, to praise "the famous man, the father that begat us."

We cannot trace genius to its source, nor account

for its appearing. It is chiefly because of this mystery that we linger so long around the accidents which attend it, and that the study of them has such an undefinable attraction, and so surely awakens our highest sympathies. In such a spirit the life of Hunter must often have been studied, and I shall therefore claim from you some recognition of my especial attachment to my theme if, as the result of it, I can contribute a new item of information towards that part of his history which is the most obscure.

We are told, Sir, by John Hunter's biographers, most of whom seem to have copied from each other an unpardonable inaccuracy, that John Hunter, the father, died when his son John was but ten years old,[1] and that before and after that time, up to the date of his coming to London, he led a completely idle life, only broken into by a short and unsuccessful apprenticeship to a cabinet-maker in Glasgow, who had married his sister and to whom he was sent for the purpose of helping him out of some embarrassment in his trade.

His father was, we know, within two years of four score when he died; and the partiality, which he must naturally have felt in his declining years for the high-spirited son of his old age, is represented as the cause of his having dealt too leniently with him, to the neglect of his real interests. The outlines of the picture are easily sketched: up to ten years the darling of a decrepit father, after ten the pet of a widowed mother,

[1] For notes see end of book.

spoilt, humoured, encouraged in idleness, unchecked, untrained, uneducated; such, I say, are the outlines, leaving a blank to be filled in according to the fancy of the biographers, who have rather dwelt upon this extraordinary contrast between the boy and the man —a contrast so complete and unintelligible that, if "the boy is father of the man," it requires a miracle to interpret it; and, in the miracle, lies some of the charm of their story.

Thus one orator writes

> "*He seems to have led the idle life of a wayward,*
> "*petted, boy until twenty years of age.*" [2]

Another depicts him as having

> "*up to twenty years of age, passed a life of*
> "*idleness,* DISSIPATION, *and amusement, with no*
> "*definite object, no settled employment—his highest*
> "*occupation that of a cabinet-maker, and his*
> "*education entirely neglected, threatening to destroy*
> "*all stability of character and all capacity for*
> "*sustained exertion.*" [3]

And a similar account is the *textus receptus* on the Continent. Thus Fischer, in his "Chirurgie vor 100 Jahren," says

> "*Hunter was destined by his father to be a*
> "*ship's carpenter, and in his twentieth year, when*
> "*he came to his brother in London, he could scarcely*
> "*read and write.*" [4]

Again, one of the latest and the most eloquent of

the Hunterian orators has thus expressed the same story:—

> "*In the first twenty years of his life he appears*
> "*to have had no inclination to science or to the*
> "*arts that minister to it, or indeed to any intellectual*
> "*pursuit. Had he succeeded in helping his brother-*
> "*in-law, who was a bankrupt cabinet-maker, cabinet-*
> "*making might have been the business of his life.*
> "*Happily he failed; and then after two years more*
> "*idleness, what was to be done?*" [5]

Well, we all know what John Hunter *did*. He came to London to work under his brother William at anatomy: and the true history of the man, as he was known to his contemporaries, begins with the famous story of his dissection of the muscles of the arm, wherein he so satisfied Dr. William, at the very first outset, with his skill and proficiency, that he received at once the promise of his unlimited patronage, and in the very next year was engaged by him to prepare anatomical subjects for the public lectures, and to give instruction to the pupils.

It is not necessary to point out to you, gentlemen, the significance of this fact, nor to remind you that it was not only the professional reputation of William Hunter, but even the advancement of anatomy in England, that was made over to John Hunter without hesitation.

Now when, in order that I might not be wanting in due pains, however much I might fail in ability,

to perform worthily the honourable task which the Council has intrusted to me—when I came to study afresh the life of John Hunter and read these accounts of his early years, I paused before believing them. They seemed for so many reasons improbable that I felt convinced that this first period of his life had not been sufficiently investigated. Is it probable, I said to myself, that a man like John Hunter, who (as my last quoted authority has well put it) "amused himself with what idle men would call hard work," would pass the first twenty years of his life in sheer idleness? Is it probable, that the hand whose carpentry was too clumsy for the Scotch, could command, without practice, such skill in dissection as to satisfy the exacting accuracy of the anatomist whose ambition it was to teach the world? Is it probable, again, that this wayward petted youth, who, they tell us, was "inclined to idleness and dissipation," and whose manners certainly cannot have been his recommendation, would have been sent by his parent to help a brother-in-law out of the difficulties of a failing trade? Is it likely, I said, that he, being the John Hunter whom we know, would have failed at cabinet-making, if he had really ever set his hand to such a craft? Or, lastly, is it likely that the keen intellect, "whose only pleasure "was thought," would have loitered in idleness at the door of that University whence his brother had so lately issued equipped for life, and not stirred himself to make some trial of its teaching? Could he stand heedless by without any attempt to find out whether the professors of human knowledge could not solve

some of the doubts and questions which must then have been engaging his young mind?

Sir, I am not sceptical by nature, and perhaps, if I had not been called upon to set my seal to it, I might not have questioned this version of the matter at all. But the more I considered it, the more my doubts increased, and I determined to examine afresh all our sources of information. I soon discovered an error in the dates. I found that John Hunter was not, as is commonly supposed, about *ten* years old, but nearly *fourteen*, when his father died. And this fact has a signal value, for it leads to the almost certain inference that John was educated at the same school as his brothers, and that he was brought under the influence of proper training during those most important years of a boy's life.

That this is the true version can hardly be doubted. Indeed, it is difficult to account for the origin of the opposite statement; for in Simmons's "Life of William Hunter," we may read that beautiful letter [6] which the father wrote in the summer of 1741, almost within three months of his death—a letter which has been so often quoted with admiration. This letter bears witness, not only to the date of the writer's death, but to another most important fact, namely, that he maintained, to the very end of his life, a clear and sound judgment, as well as the tenderest and wisest interest in the welfare of his children. In short, the letter proves that, of all fathers in the world to have neglected a son, this father would have been the very last.

So far, then, I satisfied my doubts about his schooling. John had, in all probability, the same schooling as his brothers William and James, and the same moral training.

Now let us see about the cabinet-making. The only evidence that I can find in favour of his ever having turned his hand to carpentry is the *chair*, which you all know so well as "John Hunter's chair," in which he certainly used to sit, which he is said to have made himself, and which, for aught I know, he did make. But the question whether he was ever really apprenticed to his brother-in-law is quite a different matter. The only ascertained fact is that in 1745, being seventeen years old,[7] he went to Glasgow, and, once at Glasgow, where did I expect to find him? Not in the cabinet-maker's workshop, but at the University. I wrote therefore to the clerk of the Senate, and requested him to send me the entry of John Hunter's name, if such an entry there was, in the album of the year 1745. I was not surprised to receive from the clerk a copy of an entry which testifies that John Hunter did matriculate at the University in that year. I will, with your permission, Sir, read the words of the form :—

"Novr. 1745.

"Nomina discipulorum classis quintæ (Nat. Phil.)
"qui hoc anno academiam intrarunt.

"Joannes Hunter filius Johannis Hunter (Natu
"secundus) mercatoris quondam Glasgoviensis."

From this document it is evident that he lost no time

in entering his name as a student for the course of Natural Philosophy.

You will observe, Sir, that in this entry John Hunter is called "natu secundus." Now we know that he was not the *second* but the *tenth* child of his parents.[8] It may, therefore, be objected that this entry does not refer to our John Hunter at all. But the words "natu secundus" may be accounted for in two ways: they may mean either that John was the second surviving son, which he was at that date, James having died two years before; or they may refer to the recorded fact that John Hunter had had an elder brother of the same name, and may be interpreted as indicating, not that he was the second son, but the second son who bore the name of John in the family.

The entry on the books does not imply any examination for matriculation, so that nothing is absolutely proved by it concerning the student's previous training. Nor is the fact that it is made for the natural philosophy school of particular importance. It was the usual custom for students in those days, whatever lectures they might propose to attend, to enter their names for one course only.[9] But we may conclude that this course would generally be the one which they considered of most value to them. The entry does not define, much less confine, Hunter's curriculum of study; it simply declares his predilections just in the very direction which we should have anticipated.

There are yet other considerations which throw light on Hunter's career at this time. *Dr. Cullen was*

then at Glasgow.[10] He had gone there the year before, and was lecturing on medicine at the University.

It is scarcely necessary to remind you, Sir, of the close intimacy which existed between Cullen and William Hunter. We know that it was to Cullen that William Hunter owed his attachment to medical science.[11] We know that Cullen had been for years in confidential correspondence with the Hunter family. Considering this relationship, it does seem to me that Dr. Cullen's appointment at the University in 1744 was a much more likely event to have determined John's residence at Glasgow in 1745 than any difficulties which his brother-in-law may have fallen into with his cabinet-making.

Sir, I think it difficult for anyone to resist the conclusion that John Hunter went to Glasgow to prosecute his studies under the eye of Dr. Cullen, it may be even at his invitation; nay, possibly, that at his advice he entered for the natural history course, and also attended his professorial lectures. I find, moreover, that there was a professor of anatomy at the University, and that anatomical lectures had been given there for the last three years.[12] So that assuming, as I think we may do, that he received friendly advice and occasional private tuition from Dr. Cullen, John Hunter was not so badly provided for.

If any of the letters which must have passed at this date between Cullen and William Hunter had been preserved, the correctness of my inferences would be proved or disproved at once. But unfortunately I have found none. The earliest is from Cullen to

William Hunter, dated July 12, 1751 (that is, when John had been nearly three years in London). Cullen writes

> "Your mother says nothing about 'Johnnie's'
> "coming down; but I know it would have pleased
> "her much if he had." [13]

Now, I think it extremely unlikely that Cullen would have spoken so familiarly of Hunter, when he was in his twenty-fourth year, and no longer a boy, but a man of recognised abilities and position, unless he had had a personal, not to say an intimate, acquaintance with him at an earlier date. At any rate, as far as this letter goes, it supports my argument, and one cannot expect an allusion of this nature to be more conclusive in its evidence.

But the references to John are lamentably few. Ten years later we find that William Hunter, writing to Cullen, mentions that John was going as first surgeon in the expedition against Belleisle, and he adds

> "He will, I am sure, be glad of any oppor-
> "tunity of showing his regard for you." [14]

And in 1778 Cullen writes to William Hunter

> "Please tell your brother John, tho' I do not
> "write to him, as my sons say I ought, I am not
> "the less sensible of what I owe to him. I would
> "have you and him both believe that I am most
> "affectionately yours, &c." [15]

This is not explicit, but, being in general terms, it probably refers to a general obligation, and points to

a time when there had been great intimacy between them; and if it says as much as this, it says much more, especially when read by the light of the affectionate language of the previous letter.

I have now, gentlemen, put before you all the evidence I have in support of my opinion. I have told you what led me to seek it; and the conclusions which I have drawn are so irresistible that you would be wearied by any recapitulation. The picture, indeed, is not yet filled up; but we have now different outlines from those with which we have hitherto been familiar.

Not that I wish to assert, or to seem to assert, that Hunter ever took even kindly to the *literae humaniores*; I only deprecate the exaggeration and misrepresentation which has taken the place of history. The error seems to have arisen from the carelessness and inaccuracy, which is part of the disgrace of his executor, from whose biographical memoir of him it was copied by Drewry Ottley[16] and thence perpetuated through most of the subsequent "Lives," with the addition of a few fanciful comments.

By Hunter's contemporaries I should suppose that his school and University education was known, or taken for granted, and that it was never noticed or referred to because it happened to have been unattended with any distinction. From its not being mentioned it was then unwarrantably assumed that it had never existed; and I have not wished to do more than bring it fairly forward. Having done so, I am willing to leave the subject; for, however much we may long to know the mental history of the

boy whose manhood was so wonderful,—whether it was an early tendency, accidentally held back and thwarted for a time, and then suddenly let loose, with all its originality favoured by its never having been caught and netted in a systematic teaching, or the tardy development of a rare mind that grew silently to greatness in the shadow of its own strength —be this as it may, we must admit that the activity and practical life of Hunter began with his settling in London, and that the last forty-four years of his life are the real and worthy subject of our consideration at the Royal College of Surgeons of England.

And there is one division of this period which I, as a practical anatomist, am especially disposed to make. To many it may seem an arbitrary one; but I hope that my view of it will, in your opinion, be justified by the considerations with which I shall support it.

I am inclined, then, to distinguish in John Hunter the human anatomist from the comparative anatomist, and to say that we have in him an admirable example of the method of the two studies, and of the manner in which they should both be pursued for the advancement of medical science.

The term "comparative anatomy," strictly taken, includes human anatomy, and if human anatomy has become a science on its own account, this is due to the fact that, when the anatomist investigates his own body, the importance of the subject and the interest of his inquiries make this study paramount; and, were it not for the unquestioned pre-eminence of man,

and the habit which he naturally has of considering himself the centre of the universe, this might in the language of science be called an accident.

For, in all science, it is the rule to proceed from the simpler to the more elaborate phenomena; but in comparative anatomy the reverse is the case:—we begin with man, the most complex, and proceed downwards to the simpler forms of life.

The first comparative anatomist whose writings we have—Aristotle—set this example, and gave his reason for it. "Just as," he says, "in examining coins, each "one takes as his standard that coin which he knows "best, so it is with everything else. But man is, of "course, the best known to us of all the animals."[17] Therefore he begins his work with a description of the parts of man.

Now Aristotle, with all his anatomical errors, made a splendid beginning, and his enormous genius—which, considering the field of his labours, towers over the average stature of genius like the giant Brien[18] from his glass case over his astonished visitors—his enormous genius, I say, so dazzled the men who came after him, that, instead of pursuing his investigations, they even worshipped his errors.

And his anatomy was not in a state to be thus enshrined, far from it. If he did dissect human bodies, yet his opportunities of doing so were few, and he was, consequently, driven to an expedient which became the source of many mistakes.

I will quote his own words. He says, after speaking of the external anatomy of man:

"The parts then of man which have to do with "the outward surface have been arranged in this "way, as described, and they have been distin- "guished by names, and are best known on "account of our familiarity with them. But "with the internal parts it is just the opposite; "those of man are mostly unknown: so that, "in order to investigate them, we must refer them "to the parts of the other animals, whose nature "man's resembles." [19]

In this traditional anatomy, the anatomy of Galen and his school, and of all anatomists who preceded the Renaissance, as well as of many who lived to see the sciences reviving and revived, comparative anatomy actually stood in the way of human anatomy so as to obstruct it. Human bodies were so difficult to procure for dissection, and the study of them, consequently, was so rare, that the necessary observations were, as Aristotle said, supplemented from the dissection and investigation of the corresponding organs of the lower animals. The anatomical figure of a man, if it existed in the imagination of the physician of those times, was a monster, made up, one may almost venture to say, out of various animals, based upon man, no doubt, and covered with his skin, but patched within with strange parts, one part of a sheep, another of a monkey, another of a dog, and so on.

In the present state of knowledge it is difficult to admit that this was better than nothing. Perhaps it was. But it is very like that little knowledge

which is a dangerous thing; and I will give a few examples of the errors which it led to, the hindrance which they caused, and the history of their overthrow.

At the beginning of the sixteenth century, much erroneous doctrine was held concerning the muscles of the eye. Vesalius, for instance, maintained the existence of the "retractor oculi" muscle in man.[20] And when Fallopius (who, being a later, had become a more accurate anatomist) demonstrated that this muscle existed only in some quadrupeds,[21] yet Vesalius still persisted in his opinion, and attributed the fact of Fallopius not finding the muscle to the supposed extreme emaciation of the human bodies which he had examined.[22]

On the other hand, Sylvius had to defend Galen's sternum of seven bones against the assault of Vesalius, who demonstrated that there were but three. In the discussion that ensued, Sylvius had to admit the fact, but he was undaunted, and replied that, however men might be made in their time, it was well known that in the time of Galen they had more bones in their sternum.[23]

Again, Vesalius corrected Galen's description of the omentum which had been pictured from the dissection of the lower animals;[24] and he set right the anatomy of the pylorus which Galen had borrowed from the dog;[25] and the size and relations of the cæcum which had been introduced from the carnivorous animals.[26]

But more important still, there is a possibility that it was some knowledge of the construction of the heart in reptiles which supported the theory of the "*porosity*" of the inter-ventricular septum. This doc-

trine was, probably, most mischievous in retarding the discovery of the circulation of the blood. Otherwise the description of the lesser circulation, so completely given by Servetus in his work entitled, "Christianismi Restitutio,"[27] must, one would think, have led sooner to the discovery of the greater.

A story which illustrates exactly the relations of human and comparative anatomy at that time is related of the Margrave of Baden Durlach. The physicians in attendance on this prince disputed among themselves as to the position of his heart in his thorax, one of them contending with Galen that it lay in the middle, the rest being bold enough to affirm that it was on his left side. As this unfortunate doubt assumed the aspect of a serious practical difficulty, when it came to determining the precise spot on which should be applied the plaster which was destined to relieve the sufferings of the Margrave, it was decided to appeal to nature. A pig was therefore brought into the royal chamber, and opened in the presence of the sick man. The exact position of the heart was shown to him : if in a pig, therefore in a prince. His highness gave way before this argument, and the plaster was placed accordingly, while the physician, who still had the temerity to defend himself by drawing an anatomical distinction between man and pig, was dismissed from the court.[28]

This then was the state of anatomy in Europe which Vesalius and Fallopius and the men of their time, were engaged in reforming. Comparative anatomy had been used to supplement human anatomy ; and it was now to be laid aside, till it could be established

afresh in its proper position. For the first time in the history of the world, as we know it, human anatomy was studied scientifically, accurately, and minutely, for itself and in itself. The new science was founded on the laborious investigation of nature, and firmly established on the basis on which it must ever remain. And this reformation, which was one of the most fruitful works of the Renaissance, was established by the foundation of schools of anatomy, where the new discoveries were taught, and the new methods pursued. From that time to the present, all has been continuous progress.

England had, indeed, lagged much behind in these matters. Not that our country was lacking in great men: on the contrary, it would be impossible to write the history of anatomy without giving proud prominence to British names; but these men were all taught abroad. The new era began in 1720, when Monro established the first school of anatomy in Great Britain at Edinburgh, and there was no school, worthy of the name, in England, before William Hunter, no doubt in emulation of his old master Monro, founded his school in London. We may still see the spacious building in Great Windmill Street, which contained William Hunter's famous Museum, and in which he gave the opportunity to English physicians of learning anatomy, for the first time, in their own country.

Now if I contend that William Hunter was, in a measure, to England what Vesalius and the other great men who established the study of anatomy were, to Europe—if I say this, I need only point to the results of his school

to prove my assertion. And not only did he establish the study of anatomy in England, but he was fully aware of the importance of the task which he set himself; and his lofty ambition was fed and supported by a not less lofty vanity.[29] It was the main object of his life to found a school in England which would make our country independent of European schools, and this object he achieved with singular success.

Such then was the man to whom, in the midst of his labours, his younger brother, John, came in September 1748.

And he came to learn human anatomy. I cannot doubt he had already some practical knowledge of it when he came, else how can we fancy him, as a first year's student, entrusted with the responsibility not only of making the most of the "subject," but of answering all the questions with which intelligent pupils are still wont to puzzle their anatomical tutors? Instead of "puzzle," I had almost said "teach." For I know from my own experience, that demonstrators may sometimes be, with regard to their pupils, in the position of learners rather than teachers.

Upon such a matter as this I am reluctant to make any exaggerated statement, or to utter words that may grate on any ears. But I feel it incumbent upon me to protest, as strongly as possible, against the practice of short appointments and frequent changes in the staff of junior teachers, which has lately become the fashion in many of our schools. The shortened period is, in my opinion, far too short to allow the demonstrator even to estimate the difficulty of his task, much more

to obtain a mastery of his subject, and of the art of teaching it.

The inexperienced Demonstrator, new to his work, is too apt to be over-zealous in his office. The very novelty of his position prompts him to be too ready to relieve the students in their dissections; and he is even glad of the opportunity of doing for them the work which should be done by them—and must be done by them, if they are to master their subject.

And the effect of all this is seen, too plainly, in the sad results of our examinations, both primary and pass —results which I, for one, should hesitate to impute entirely to the severity of the examiners or to the remissness of the students.

How often, when we place the beautiful preparations of the Museum before the candidates, do they gaze at them as at objects imported from another world, the like of which they had never so much as dreamt of! How often do we find that it is the simplest and most elementary questions that they are most unable to answer! And where does the blame lie?

Let us look a little more closely to our teaching. This I think we may fairly regard with suspicion. The average mind is so keenly alive to subjects in which it is interested, that it is hard to believe the results which we see, are the best attainable by teachers who have awakened the interest of their pupils as it might be awakened; for, surely, as man is the crown of the visible creation, the study of man may be made to excite more wonder, reveal more beauty, and convey more instruction than almost any other subject whatever.

And the study of anatomy and physiology cannot but do all this in the hands of an able and earnest teacher, who aims at something higher than a mere loading the memory with what are justly called dull and dry facts. Such a teacher will make his pupil feel at ease in a maze of detail in which he is apt to be bewildered; he will have a clue ready at every turn, and not depend on one way only for threading the difficulties, from which way he dare not turn, either to right or left, lest he should himself be lost; he will infuse life into the dead body, connect function with structure, and never omit to point out the useful application of each item of knowledge.

Now Hunter's writings teem with examples which show what an impressive teacher he was, how supreme was his skill in turning all his knowledge to account, and with what happy enthusiasm he started others on the road to gain knowledge for themselves. To take a single instance, I would especially point to his description of the organs of mastication and digestion. I commend this to the study of everyone who wishes to be a learner or a teacher of anatomy. For myself, I can only say that, when I first read it, it filled me with astonishment. Would to Heaven, I said, that we had the whole of anatomy described in this powerful way! We should then hear fewer complaints of its "dryness and dulness." The language is so lucid, so terse, and withal so pictorial. There is an interest, too, and charm in every detail, and with each fact is given some illustration, with all the text its proper and full context.

We cannot, indeed, be expected to bring to any anatomical subject the context which Hunter's well-stored mind enabled him to bring. What a mind his was, how full of light ready at any moment to be brought to bear upon the subject in hand, we may imagine, when we read that he was in the habit of neglecting to catalogue the specimens which he added to his vast museum, and that he depended, entirely and without misgiving, on his memory for all the particulars relating to them. This is a most astounding fact; and it shows that all the circumstances connected with any subject which had once interested him, were always afterwards present to his mind, or could at least be summoned at a moment's notice; and summoned, not as so many things accounted for and done with, but with all their various bearings and unsatisfied relations ready for re-adjustment and awaiting their due application. It seems, indeed, incredible, and with such a gift we may imagine what a wonderful teacher he must have been![30]

Hunter spent twelve years chiefly in teaching—in other words, in learning—human anatomy in his brother's school. In those years he had been an acute observer and most laborious collector of facts. He then passed finally to comparative anatomy.

And the motive which led him to comparative anatomy was not a wish to classify or even to study the animal kingdom for its own sake. He was, above all things, surgeon, then comparative anatomist and physiologist, and it was his longing to found physiology on a sound basis, and to connect pathology with physio-

logy, that led him to his goal. He had had predecessors and teachers in anatomy, but in physiology he planned and struck out a highway of his own.

> "REASON tells us, if my authority carries
> "any weight in this matter, that disease, however
> "hostile its causes may be to the human body, is
> "nothing else than Nature exerting all her
> "strength in an effort to destroy morbific material,
> "in order to save the sick man." [31]

Now these are not Hunter's words. They are the first words of Sydenham in his book on Acute Diseases. They are Sydenham's theory of pathology, written in 1676—nearly a hundred years before Hunter's time. He separates decisively the causes of disease from the symptoms of disease, and compares the symptoms to healthy physiological processes. We read and admire. It is a theory which Hunter would have accepted, indeed he might have written the very words. It is the result which he arrived at independently, which we all now accept, and which we may take for the very basis of our practice.

As far, then, as the general theory of disease went, Hunter was not original. But he was original in the manner which is more useful to mankind. He demonstrated absolutely the truth of Sydenham's view of disease, especially with regard to inflammation, and, by his observation and experiment, placed the whole matter beyond the field of theory. Nor was the view which his lofty intellect thus actually established at all commonly received in his day. We find very good sense

in Sydenham; but wherever else we look in the century which intervened between our two great countrymen, we find nothing but unintelligible confusion. It was in vain that Bacon had raised his voice to herald the age of experimental science; the advice, which he gave specially to physicians, fell on deaf ears. There never was a time when there were so many or such various theories of life and disease. Even the new discoveries gained by the experimental method seemed to be used chiefly as bases for new theories of fantastic imagination. Harvey's discovery of the circulation of the blood was, I believe, especially fertile in mathematical theories of vital phenomena. And then the chemists were very busy and ingenious. I do not know much about the various systems of these theorists and their origins and histories. I know more of the points, at least, in which they agree than of the characteristics by which they differ; and they all agree in this—that they are all unintelligible and all forgotten. Far be it from me to wish to introduce them into this theatre! Let their names perish with them!

And so said Hunter, who found them all flourishing and quarrelling. He brushed them all aside, and set about investigating nature for himself. In physiology he saw the road to a true pathology, and physiology meant comparative physiology and experiment, and therefore comparative anatomy. . . .

> "For ten years," says Fischer of Hannover, "Hunter dissected only human subjects, and "then began with animals, for he found that only "comparative anatomy could give any satisfac-

"tory solution of the many complicated problems
"before him. And in his dissections of animals
"he never lost sight of the proper application of
"his discoveries to human anatomy, and always
"sought after general laws." [32]

From animals he went to plants, and from plants to crystals:—

"In short, his aim was to unite scientifically
"all the departments of nature, in order that he
"might then be able to proceed (in his method)
"from the simplest up to the most complicated
"forms. He assumed that Nature still main-
"tained her regularity, even where she seemed
"most to depart from it; and that, under certain
"circumstances, even the exception to her law is
"a part of her law." [33]

Now this is what I call the true medical use of comparative anatomy, and I have great pleasure in quoting this testimony from a foreign writer, whom I here thank in the name of us all for his extremely just and complimentary treatment of English surgery. There is no more true and faithful sketch of John Hunter than that which Fischer gives in his book, and I know of no history of surgery which more decisively estimates the claims of our countrymen at their proper value.[34]

But the opinion of Fischer as to the pre-eminence of John Hunter over all other European surgeons, ancient or modern, is now commonly shared and

generously conceded both in France and Germany. Thus Professor Billroth, in a letter to me, does not hesitate to speak of Hunter as

> "one of the greatest men the English nation has "produced . . . . who by his work on 'Inflam- "mation and Gunshot Wounds' laid the corner- "stones of modern English and German surgery."[35]

And elsewhere Billroth has written :

> "From the time of Hunter to the present "day, English surgery has about it something "noble. In the scientific, as well as in the prac- "tical part of surgery, and of medicine generally, "England is now more advanced than any other "country."[36]

Again, when the complete translation of Hunter's works first came out in Paris, M. Royer-Collard spoke of it as a great scientific event, and congratulated his countrymen on being able to study at leisure

> "one of the most beautiful monuments raised in "modern times by the genius of science."[37]

And it was a great mission of Hunter's to found "pathology" on comparative physiology; to rescue disease from the grasp of quacks, fanatics, and system-mongers; and to restore it to the rank where Sydenham would have placed it—beside the beneficent regulations of nature which govern the body in health. And he must read history amiss who does not set the highest value on such work.[38]

I have referred to Hunter's books to illustrate his

ability as a human anatomist. To show him as a comparative anatomist we must go into his Museum. If he could enter it himself after an absence from the earth of eighty seven years, I do not know whether he would be more pleased at finding it so little altered, or, at its having been so much enlarged. It is true that one section—that of the stuffed birds—has disappeared altogether. (I am indebted to our highly-valued curator, Professor Flower, for this and for other information concerning the state of the Museum.) It is true that some sections have been so much enlarged that he would scarcely recognise them. There are three thousand specimens of skulls, for instance, in the place of his fifty, and his pathological specimens have been more than doubled. But in the series of comparative physiology, on which he bestowed the most pains, he would see the very materials, which he gathered with his own hands to lay the broad foundations of his new science, still in the same order in which he had placed them; he would see his own arrangement rigidly adhered to in every detail, and his own specimens still outnumbering the additions of a century.

Considering the immense progress which has been made in these sciences since the time of his death, the changes of systems which have taken place, and the vast materials which research is always contributing to natural history—this would be a great triumph for him, and a proud verification of his own blunt prediction:—

> "When this John Hunter is gone, you will not
> "easily get another." [39]

But most of all would he delight in the skeleton of the great whale. Like Aristotle before him, he took especial interest in huge marine animals; and as Aristotle distinguished himself by describing the cartilaginous fishes as a special genus, so Hunter left a magnificent monograph "On the Structure and Œconomy of Whales." In his anxiety to procure specimens, he sent, at his own expense, a surgeon on a voyage to Greenland, providing him with all necessaries requisite for examining and preserving the more interesting parts, and with instructions for making general observations. But fancy his disappointment when (to use his own words) he "found that the only return he received for his expense was a piece of whale's skin, with some small animals sticking upon it." Fancy his delight, if he could see the monster he had so fruitlessly pursued in life, hanging in chains before the very eyes of his statue.

I say, fancy his delight! And for us—who know so well his figure and his features, his manner of life, his manner of speech, his studies, his pleasures, and, alas! his pains and infirmities—for us, it needs but a small effort of imagination to see him in his Museum as plainly as if he were walking there in the flesh. So immortal is the personality of Genius!

Sir, I must now discharge a solemn duty, and commemorate the names of two of our fellow-labourers who have passed away from us since our last anniversary.

Henry Hancock was for thirty-seven years a fellow

of this College, and seventeen years ago was elected a member of the Council. In 1872 he was our President. He was a true follower of Hunter, an ardent and successful teacher, and did much to improve the Surgery of the Foot, which most of us can remember was the subject of his lectures in this theatre, in the years 1865–66. His name will be transmitted to posterity as the originator of an operation for the relief of glaucoma, which consists in the division of the ciliary muscle. His long life was spent in labour and good works; and we lost in him not only a most able colleague, who, energetic in attack and undaunted by opposition, always took the keenest interest in the affairs of the profession and of this College, but a thoroughly true and honest man, a most genial and amusing companion.

Multis ille bonis flebilis occidit:
Nulli flebilior quam Mihi.

George Wm. Callender, one of my own colleagues at St. Bartholomew's, was called away from us in the prime of life, when he was most busy in carrying the Hunterian principles of surgery into their fuller development. And I have no hesitation in calling "Antiseptic Surgery" Hunterian; nor, as far as I know, has any one experienced better results from this method than Callender. His memory has already been honoured by one whose writings will always be held sacred in our profession, and I can add nothing to the eloquent words in which it has been enshrined.[40]

I propose, Sir, with your permission, to devote the

few remaining moments to a question which has of late divided our society into two opposite camps,—whether we ought or ought not to require from our students a preliminary knowledge of the Classics.

Greek and Latin literature — whether the Royal College of Surgeons, or even the Universities, insist on its study or not—will ever be held in the highest estimation. The more completely it should happen to be set aside for a time, the greater would be the force of the inevitable reaction which would bring it again into power.

The question about which there is a difference of opinion is plainly this:—Is it or is it not a waste of time for students to spend so many years of their early life in the study of Greek and Latin, preparatory to entering the profession? It is a matter of the utmost importance to us personally, and I should be sorry to lose this great opportunity of expressing my own convictions on the subject.

First, therefore, I will ask you, Sir, and all who have taken part of late years in our examinations, whether you have found as a matter of fact, that ignorance of the classics is compensated for by a knowledge of science, and that the best scholars are the worst anatomists? And this, I take it, would be the case if the question were merely one of economy of time; if the hours, which are now said to be wasted in learning classics, were really better spent upon other subjects. But, since it is a matter of experience that those who come before us best prepared in professional subjects are just those who have had the most complete classical

training, it is evident that any surrender of this training is designed as an indulgence to the less intelligent and industrious who seek admission within our ranks.

The mind must undergo a long training before it is fit to grapple with science, and if we set aside classical education we shall be ignoring the value of the best system of training which exists; and upon this point I need only refer you to the verdict given by H.M.'s Endowed School Commissioners.[41]

And my own experience as a teacher for forty years fully corroborates their judgment. In students who have had a public school training I have found a fuller development of the logical faculty—a more cultivated memory, a greater grasp and power of combination. I have found the task of teaching them so much easier, that I have no hesitation in saying that I can teach such pupils more in two months, than others who have had no like education in six.

Bearing this in mind, let us strive to raise rather than lower the standard, by requiring a proof of sound classical training from those who, if they have not had this, have probably had little or no mental training whatever. Above all let us not further hamper our noble profession, which in nine cases out of ten is taken up as a means of gaining a livelihood, with the stigma of being illiterate, nor subject the youths who are to be the future representatives of English surgery to the danger of being looked upon as "symbols" of an inferior education.

Let us most earnestly incite them to acquire, at the only time of life when they are likely to acquire it,

some initiation into the thought and life of the grandest period of the world's history; let us not draw a veil over their eyes which must hide from them the light of that splendid illumination before which all modern thought as well as art must bow; to the rekindling of which we owe our own brilliant outburst of energy; which is necessary, I am bold to say, to the intelligent and proper study of our most holy religion, and which holds the keys of all that is most ideal and divine in the life of man.

NOTES.

Note 1. 'Life of Hunter,' by Sir Everard Home, prefixed to Hunter's 'Treatise on the Blood, Inflammation, and Gunshot Wounds.' Quarto. 1794.

2. 'Hunterian Oration,' by Sir Wm. Fergusson, 1871, p. 32.

3. 'Hunterian Oration,' by Babington, 1842.

4. 'Chirurgie vor 100 Jahren : historische Studie,' von Dr. Georg Fischer, in Hannover. Leipzig, 1876, p. 285.

5. 'Hunterian Oration,' by Sir James Paget, 1877, p. 2.

6. 'An Account of the Life and Writings of the late William Hunter, M.D., F.R.S.,' by Samuel Foart Simmons, M.D. London, 1833.

The letter alluded to in the text as written by John Hunter's father is dated July 28, 1741. The writer died on October 30 following. Therefore John Hunter, born February 14, 1728, must have been nearly fourteen when his father died.

7. 'Life,' by Sir Everard Home.

8. The following were the names of these ten children in the order of their birth :—John, Elizabeth, Andrew, Janet, James, Agnes, William, Dorothea, Isabella, and *John*. Of the sons John the eldest died young. 'Life of Wm. Hunter,' by Simmons, p. 1.

9. This statement is made on the authority of the 'Life of Wm. Cullen, M.D.,' by John Thompson, M.D., vol. i. p. 2.

10. 'Life of Cullen,' by Thompson, vol. i. p. 21.

11. William Hunter, who had been educated at the University of Glasgow, was intended for the Church ; but, beginning to entertain doubts with regard to some of the articles of faith, to which, as a clergyman, it would have been necessary for him to subscribe, he resolved to abandon the study of theology. In this state of

mind, he happened to become acquainted with Dr. Cullen, who was then just established in practice at Hamilton. Dr. Cullen's conversation soon determined him to lay aside all thoughts of the Church, and to devote himself to the profession of physic.

His father's consent having been previously obtained, W. Hunter, in 1737, went to reside with Dr. Cullen. In the family of this excellent friend and preceptor, he passed nearly three years; and these, as he has been often heard to acknowledge, were the happiest years of his life. See 'Life of Dr. Cullen.'

12. Dr. Robert Hamilton was Professor of Anatomy and Botany, but gave no lectures on Botany.—'Life of Cullen,' vol. i. p. 24.

13. Thompson's 'Life of Cullen, vol. i. p. 540.

14. Thompson's 'Life of Cullen,' vol. i. p. 551.

15. Thompson's 'Life of Cullen,' vol. i. p. 565.

16. 'Life of John Hunter,' by Drewry Ottley, prefixed to the 'Works of John Hunter,' by James F. Palmer. London, 1837.

This Life is certainly the best. Nevertheless, while finding fault with other memoirs of John Hunter, and professing to write 'a full and faithful account' of him, Ottley does not hesitate to adopt the erroneous story that 'Hunter's father died in 1738, . . . and John was thus left, at ten years of age, to the care of a fond and apparently over-indulgent mother,' p. 3. Again further on, at p. 6, he shows a want of accuracy in stating a fact, which, if worth stating, should have been stated correctly; namely, that 'John Hunter was in his twentieth year,' when he wrote to his brother in London to offer his services. Now, J. H. himself states that he came to London in September 1748. Surely, therefore, born in February 1728, he must have been advanced in his twenty-first year.

17. 'Hist. Anim.' i. 6 ed. Bekker :—*πρῶτον δὲ τὰ τοῦ ἀνθρώπου μέρη ληπτέον, ὥσπερ γὰρ τὰ νομίσματα πρὸς τὸ αὐτοῖς ἕκαστοι γνωριμώτατον δοκιμάζουσιν, οὕτω δὴ καὶ ἐν τοῖς ἄλλοις· ὁ δ' ἄνθρωπος τῶν ζῴων γνωριμώτατον ἡμῖν ἐξ ἀνάγκης ἐστίν.*

18. The magnificent skeleton of O'Brien, the famous Irish giant, who died in 1783, is nearly eight feet high, and heads the osteological collection in the Hunterian Museum, at the Royal College of Surgeons.

19. 'Hist. Anim.' i. 16 ed. Bekker :—*τὰ μὲν οὖν μόρια τὰ πρὸς τὴν ἔξω ἐπιφάνειαν τοῦτον τέτακται τὸν τρόπον, καὶ καθάπερ ἐλέχθη, διωνόμασταί τε μάλιστα καὶ γνώριμα διὰ τὴν συνήθειάν ἐστιν· τὰ δ' ἐντὸς τουναντίον· ἄγνωστα γάρ ἐστι μάλιστα τὰ τῶν ἀνθρώπων, ὥστε*

δεῖ πρὸς τὰ τῶν ἄλλων μόρια ζῴων ἀνάγοντας σκοπεῖν, οἷς ἔχει παραπλησίαν τὴν φύσιν.

20. 'Est enim, praeter commemoratos oculi musculos, alius adhuc grandis, et undecumque ab illis et eo quem diximus adipe circumdatus, ac solus similem figuram illi quam priores sex simul efformabant, constituens. Nam musculus iste paulo anterius, quam sex illi, à dura quoque membrana, nervum visorium involvente, principium assumit carneum, quod nervum illum orbiculatim ambiens, in prioraque porrectum, instar turbinis tantisper dilatescit, dum musculus posteriorem oculi sedem contingat, illique circuli modo carneus implantetur, non quidem proximè ad nervum visorium, sed ferè ubi oculus hac posteriori sede amplissimus fieri incipit. Quemadmodum verò inter hunc musculum et sex priores adipem repositum dixi, ita etiam inter nervum ipsum et praesentem musculum eo intervallo, quo is à nervo abscedit, adeps colligitur. Musculus hic nullam prorsus inscriptionem obtinet, nisi fortassis unam in inferiori sede, secundum ipsius longitudinem protensam. Unde etiam miror hunc non unius musculi loco ab Anatomicis enumeratum fuisse, sed ab aliis duorum, ab aliis trium, quum interim musculum hunc vix obiter omnes descripserint. Ac proinde etiam vereor ipsos non admodum aptè illius usum expressisse, dum hunc privatim retentionis oculi in sua sede autorem esse asserunt, nullum praeterea illi usum adscribentes.

'Quum tamen sex priores musculi id munus sibi aptius vindicare possint, quòd externa ipsorum superficie, membranae oculi sedem in calvaria exsculptam succingenti, fibris quodammodo connascantur, septimum musculum undique in se occultantes, ac ne calvariam ullibi contingat, arcentes. Quinimo fortè non deerunt, qui sex musculorum exortum non à membrana nervum investiente, verùm ab illa quae os succingit, pendere contendent, quum interim septimus musculus multis intervallis undequaque ab os succingente membrana distet: quod profectò factum non fuisset, si modò hujus beneficio oculum in sua sede retineri, ac quodammodo ad cerebrum trahi oporteret. Proinde si ipsius naturam accurate rimatus fueris, illum instar tegumenti visorio nervo obduci concedes, et postmodum etiam oculum rectis motibus agere fateberis, prout nimirum has illasve sui corporis fibras contraxerit relaxaveritve.'—Andreae Vesalii 'Opera Omnia Anatomica et Chirurgica cura Hermanni Boerhaave et Bernhardi Siegfried Albini,' lib. ii. cap. xi. p. 197. Lugduni Batavorum, M.DCCXXV.

21. 'Omnes qui de musculis oculorum hucusque scripsere, aut publice profitentes (quod ego sciam) loquuti sunt in publicis dis-

sectionibus, male plane illos enumerant. Nam à divino Vesalio incipiam : ipse nobis septem musculos enumeravit, qui quidem in bove reperiuntur, quatuor scilicet motibus rectis, et geminos circularibus inservientes ; non recte tamen mea sententia, ut sunt in bove collocatos. Septimum addit, qui magnus ad radicem oculi situs est.'—Gabrielis Fallopii 'Observ. Anatom.' p. 711 apud Vesalium, l. c.

22. 'Post hoc septimus à me commemoratur musculus, cujus in homine absentiam in marcorem potius, et multam flavi adipis copiam insignemque hominis mollitiem in animo meo rejicere soleo, quam quod illo tam elèganti, et raro musculo hominem vere destitui existimarem.'—A. Vesalii 'Obs. in Gabrielis Fallopii Examen,' l. c. p. 781.

23. 'Adversus Jacobi Sylvii Depulsionum Anatomicarum Calumnias, pro Andrea Vesalio Apologias.'—Renato Henero, Medico Autore. Venetiis, M.D.LV. p. 83.

24. 'Vesalii Opera Omnia,' lib. v. cap. iv. p. 423.

25. Id. ib. cap. iii. p. 418.

26. Id. ib. cap. v. pp. 426–7.

27. 'Christianismi Restitutio : Totius Ecclesiæ Apostolicæ ad sua Limina Vocatio,' auctore Michael Serveto, ab Aragonia, Hispano. 8vo. 1553.

In this work, on the Restoration of Christianity, the great fact in physiology of the transit of the blood from the right to the left side of the heart through the lungs is first definitively proclaimed to the world. The printing of the book led almost immediately to his arrest and prosecution for heresy, at the instigation of Calvin, by the authorities of Vienne. He escaped from prison, however, through the connivance of his friends ; but it was only to fall into the hands of the Reformer of Geneva, at whose instance he was again arrested, cast into the felon's dungeon, put upon his trial for life or death, and being condemned to die, he perished at the stake, in the forty-fourth year of his age, and the fifteen hundred and fifty-third of the Christian era.—See 'William Harvey, a History of the Discovery of the Circulation of the Blood,' by R. Willis, M.D. London, 1878.

28. 'Ad hæc Sua Celsitudo (Durlachii Badensis Ill^{s} D. Marchio) conticuit et aliam quaestionem protulit, percontando, ubi cor suam sedem habeat, respondi "in thoracis medio" : tum S. C. regessit potius inclinare ad regionem sinistram ob pulsum eo loci

magis conspicuum, referebam id contingere, ob sinistrum cordis ventriculum, in quo arteriarum origo, a quibus pulsus obveniat, alias teste Galeno (lib. vi. *de usu part.*) consistere in medio pectore : ad hæc etiam siluit.

'Quod autem quaestionem de situ cordis proposuit, exin nata est occasio. Cum aliquando ingenti cordis palpitatione laboraret, duo medici Heidelberga evocati in auxilium, inter cetera remedia ordinatum epithema cordiale, ibi rixa et contentio cum Medico aulico Durlacensi, quo loci illud esset applicandum, et tum litigium de situ cordis, illis contendentibus in sinistro latere locatum, isto autem in medio situm asserente ; tandem cum neutra pars cedere vellet de conceptâ opinione, Medici Heidelbergenses provocabant ad experientiam et anatomiam, cujus medio ista controversia sit dirimenda. Cum autem scrofæ viscera interanea, quoad situm, haud dispari modo disposita ac in corpore humano, ipsa fuit mactata et in conclave delata, corpore aperto, cum videretur cor inclinare versus latus thoracis sinistrum, illi triumphantes de victoriâ, Medicum aulicum incusantes ignorantiæ et apud Suam Celsitudinem deferentes quod tam imperitum alat Medicum, cui incognitus situs cordis. Exin D. Marchio tantam concepit indignationem, ut Medicum aulicum officio motum alio relegavit. Exin etiam apparet, quam inimica res sit aemulatio Medicorum et quam detrimentosa calumnia.'—Augustini Thoneri 'Observationum Medicinalium haud trivialium libri quatuor,' lib. ii. p. 102. Ulmae. M.DCXLIX. 4 min.

29. Speaking of the discovery of the absorbent system, which he claims as his own, William Hunter says : 'This discovery gains credit daily, both at home and abroad, to such a degree, that I believe we may now say that it is almost universally adopted ; and, if we mistake not, in a proper time, it will be allowed to be the greatest discovery, both in physiology and pathology, that anatomy has suggested since the discovery of the circulation.'

Again : 'Since the days of Aristotle there have been only two great inventions in the physiology of our bodies ; to wit, the circulation of the blood and the absorbent system.'—'Two Introductory Lectures,' by Wm. Hunter. London, 1784, p. 59.

30. Mr. Cline, born 1750, one of the Surgeons of St. Thomas's Hospital, says in his 'Hunterian Oration,' 1824 : 'When only twenty-four years of age, I had the happiness of hearing the first course of lectures which John Hunter delivered. I had been at that time for some years in the profession, and was tolerably well

acquainted with the opinions held by the surgeons most distinguished for their talents then residing in the metropolis; but having heard Mr. Hunter's lectures on the subject of disease, I found them so far superior to everything I had conceived or heard before, that there seemed no comparison between the great mind of the man who delivered them, and all the individuals, whether ancient or modern, who had gone before him.'—'Life of Sir A. Cooper,' by B. Cooper, vol. i. p. 94.

31. 'Dictat Ratio, si quid ego hic judico, Morbum, quantumlibet ejus causae humano corpori adversentur, nihil esse aliud quàm Naturae conamen materiae morbificae exterminationem in aegri salutem omni ope molientis.'—Thomae Sydenham 'Opera Omnia,' tom. i. cap. i. 'De morbis acutis in genere.' Londini, M.DCCCXLIV. Ed. G. A. Greenhill, M.D.

32. Fischer, loc. cit. p. 286.

33. Fischer, loc. cit. p. 290.

34. The following is a characteristic quotation from Fischer: 'Mit John Hunter beginnt ein Wendepunkt in der Chirurgie. So gross die chirurgischen Fortschritte des 19. Jahrhunderts auch sind, so müssen wir doch, ohne im Geringsten die Verdienste unserer Zeitgenossen zu schmälern, eingestehen, dass in der Chirurgie keines einzigen Volkes ein so grosses, allumfassendes Genie bis auf den heutigen Tag wiedergeboren ist. J. Hunter gehörte zu den äusserst seltenen Erscheinungen, welche nur in langen Zwischenräumen auftreten, und war ebenso gross als Chirurg wie als Anatom, Physiolog, Patholog, und Naturforscher. Die Kraft seines Geistes war eine so ausserordentliche, dass er mit Aristoteles, Harvey und Bichat in gleichem Range steht. Will man einen Vergleich zwischen englischen und französischen Zeitgenossen wagen, so stelle man Desault neben Pott, und Bichat neben J. Hunter. Nur dass jener sich auf den Menschen beschränkte, während Hunter seine Forschungen nicht allein auf die Gesetze der Krankheit bei Menschen und Thieren, sondern über den ganzen Umfang der Natur, der organischen und unorganischen, ausdehnte und alle Formen des Lebens bis zur tiefsten Tiefe zu ergründen suchte. Das Ziel, welches er stets vor Augen hatte, war die Auffindung der Gesetze des Lebens; denn nur eine vertraute Bekanntschaft mit ihnen kläre die Krankheitsursachen auf, ohne deren Kenntniss Niemand Wundarzt sein könne. Dabei bewegte sich sein Geist so frei, dass die grössten Entwürfe ihn

nicht überwältigen konnten. "Das Denken machte ihm Vergnügen," wie er selbst erklärte.'—Fischer, loc. cit. p. 285.

35. It will probably interest some of my readers if I give Billroth's letter *in extenso*.

Wien : 12.8.80. Alserstrasse 20.

Hochgeehrter Herr College,—Ich verehre John Hunter als einen der grössten Männer, welchen die englische Nation hervorgebracht hat, und oft habe ich ihn in meinen Schriften erwähnt. Am ausführlichsten habe ich über ihn geschrieben in meiner ersten Arbeit über Wundfieber ('Arch. f. klin. Chirurgie,' Bd. ii. p. 326). Ich habe dort durch Citirung seiner Worte nachgewiesen, dass sich seit seiner Arbeit über 'Blut, Entzündung und Schusswunden' unsere Anschauungen über Wundfieber bis 1862, wo die Arbeiten von O. Weber und mir erschienen, durchaus nicht geändert haben. Selbst so grosse Männer wie Cooper, Dupuytren, Larrey liessen die Theorie Hunter's bestehen, dass das Wundfieber ein Reizfieber sei. Durch meine späteren Arbeiten wurde die Bahn gebrochen zur humoralen Auffassung des Wundfiebers als einer *Febricula septica*. Es finden sich dann auch in einer kleinen, selten gewordenen Schrift von mir ('Historische Studien über die Beurtheilung und Behandlung der Schusswunden,' Berlin, 1859, p. 59), folgende Worte: 'John Hunter ist als der Hauptbegründer der modernen englischen und DEUTSCHEN Chirurgie anzusehen; er war durch und durch ein Genie, von dem Baillie mit Recht sagt: "There is no subject which he had considered where he has not added new light."' Ich halte es für das Wesen der modernen Chirurgie, dass sie ihre Fortschritte stets im Zusammenhang mit der Anatomie, Physiologie und experimentellen Pathologie macht, und sich dadurch von einem Kunsthandwerk zu einer Wissenschaft erhoben hat. Diese Methode der Arbeit, zumal das Heranziehen des Experiments zum Verständniss pathologischer Processe, finden wir vor Hunter kaum. Astley Cooper, den ich nächst Hunter für den grössten Chirurgen Englands halte, hat diesen Weg fortgesetzt. Dann traten eine Zeit lang die Forschungen auf dem Gebiet der pathologischen Histologie in den Vordergrund; bald verband sich aber auch diese mit dem Experiment, und so kam der rapide Fortschritt zu Stande, dessen Zeugen wir gewesen sind, und noch sind. Ich kann es nur lebhaft bedauern, dass manche jüngere Chirurgen, in ihrer Begeisterung für den letzten grossen Fortschritt durch die antiseptische Methode, ganz vergessen, dass dieselbe doch auch nur ein Resultat aus den Arbeiten unserer Vorgänger ist, ein Glied in

einer grossen Kette, die zum Heil der Menschheit noch recht lang werden möge. Ich verehre Lister's und Volkmann's Arbeiten und ihren Eifer der antiseptischen Methode überall Eingang zu verschaffen sehr, und erkenne darin einen eminenten Erfolg der richtigen Combination von Theorie und Praxis. Doch wenn die Uebereifrigen versichern, nun fange die Chirurgie erst an, Alles frühere sei nur von historischem Werth, gehöre in ein Museum oder in eine alte verstaubte Bibliothek, so kann ich damit nicht übereinstimmen. Ich für meine Person werde mich stets glücklich schätzen, wenn meine bescheidenen Arbeiten sich in einem Bücherschrank vorfinden sollten, in welchem die Werke eines John Hunter, Astley Cooper, etc., aufbewahrt werden. Mit freundlichstem Gruss hochachtungsvoll,

W. Th. Billroth.

36. 'General Surgical Pathology and Therapeutics,' by Dr. Theodor Billroth. Translated from the fourth German edition, and revised from the eighth, by C. E. Hackley, M.D., London, 1880, p. 13.

37. Truly, Hunter's repute as a great anatomist and surgeon had long been heard of in France; but his real work was hardly known there at the earlier part of the present century. The first direct notice of him seems, so far as I can ascertain, to have been taken by Breschet, who published in 1816, in the 'Bulletins de la Société Médicale d'Emulation,' a sketch of 'Hunter's Theory of Life' (taken from Mr. Abernethy's Lectures at the College) together with a few extracts from Hunter's 'Treatise on the Blood and Inflammation.'

Not till the translation of Palmer's edition of 'Hunter's Works,' by Richelot, came out in Paris in 1839, had French surgeons a complete opportunity of appreciating the extent and scope of his labours. The originality of his views occasioned not a little surprise in the French schools of medicine.

The following are a few extracts from a review of Hunter's Works, by M. Royer-Collard, 'Gazette Médicale de Paris,' 1840, p. 382 :—

'Entre les divers travaux de l'année médicale qui vient de finir, la publication des Œuvres Complètes de J. Hunter efface tous les autres par son importance, et appelle d'abord notre plus sérieuse attention. C'est plus qu'un livre qui a paru, c'est un véritable événement scientifique; c'est presqu'une découverte. Il nous est permis, enfin, de contempler à loisir l'un des plus beaux monuments

que le génie de la science ait élevé dans les temps modernes. Nous pouvons étudier et connaître dans toutes ses parties cette grande œuvre, presque aussi nouvelle pour nous, après cinquante ans, qu'elle le fut aux jours mêmes de sa naissance. . . . .'

'Nul, peut-être, n'a poussé aussi loin que lui l'observation exacte et minutieuse des faits, mais nul n'a possédé à un plus rare degré ce que Buffon appelle "cette faculté de penser en grand qui multiplie la science:" nul n'y a établi un plus grand nombre de ces vues générales qui la vivifient et la fécondent. Il a égalé Cuvier par la précision et la sûreté de la méthode, qui est constamment celle de Bacon et de Newton, la vraie, la seule méthode scientifique: il l'a surpassé par la hauteur de sa philosophie, par la puissance et l'originalité de sa conception. . . . . .'

'Convaincu que les mêmes lois président à l'état sain et à l'état morbide, il retrouve, dans les formations pathologiques, cette même force plastique dont il a donné, avant que personne n'y eût songé, une si admirable théorie. Tout ce qu'ont établi plus récemment Bichat, Pinel, MM. Dupuytren et Broussais, sur les diversités de l'inflammation dans les divers tissus, Hunter le signale, et souvent le développe avec détails. Il est le véritable créateur de l'anatomie et de la pathologie générales. Dénué de la plupart des ressources que possède aujourd'hui la foule des médecins, il a trouvé seul, et par la force de son génie, presque toutes les vues saillantes, que nous avons admirées comme nouveautés dans ses plus illustres successeurs. . . . .'

38. Hunter's great idea was to raise surgery into a science.

To do this, he saw that a knowledge of human anatomy, however minute, was not enough.

He saw that it was necessary for a surgeon to have a comprehensive knowledge of physiology and pathology—in other words the laws of life in health and the laws of life in disease.

He saw that, though apparently different, they were intimately connected; that they mutually illustrate and explain each other, and should be fused into a single study.

Still, he felt that the laws of nature in health must be first understood; by these we should be led up to the laws of disease.

To ascertain the laws of nature in health, Hunter's researches were not confined to man. He covered the whole range of the animal kingdom—step by step—from the most intricate, down to the most lowly organised creatures.

But he did not stop here—he went into the vegetable world, and investigated it in a like manner.

Nor did he stop in the vegetable world—he even studied the common inanimate matter of the globe—for he says, 'the better to understand animal matter, it is necessary to understand the properties of common matter, in order to see how far these properties are introduced into the vegetable and animal operations.' 'In their decay, both animals and vegetables go through a series of regular spontaneous changes, until the whole return to common matter from whence they arose, for *to the earth they must go from whence they came.*'

Thus Hunter's reach of thought and work carried him into inorganic science, where he clearly saw the foundations of all organic science must be laid.

With this view he examined the structure of crystals, of which he had a valuable collection, both of *regular* and *irregular* forms, which he was accustomed to use in his lectures to exemplify the difference between the laws of growth of organic bodies and the increase of inorganic bodies. *His idea was that irregular crystals were pathological crystals.*

So far, it is universally admitted that Hunter laid, in his Museum, the materials of the basis of a new science, *comparative physiology.*

Having, in this manner, i.e. by an appeal to nature, obtained an insight into the general laws of the animal and vegetable economy in *health*, Hunter was satisfied that he had the key to the right understanding of *pathology*, not only in the animal, but in the vegetable world.

Hunter's great *mission* was pathology. Of the laws of pathology he was constantly in search. To discover them was his high aim. He knew that the discovery would raise surgery to a science.

His observations led him to the conclusion that the laws of pathology were identical with the laws of physiology; and that the best way to get a knowledge of human pathology was to survey the whole of nature as he had done.

As an instance, I may refer to his showing his class an oak-leaf which he had picked up in his garden. On this leaf were several excrescences which we call oak-galls. These excrescences he found to be the results of irritation occasioned by a small insect—the excrescences being the organised exudation following *inflammation.* 'Lectures on the Principles of Surgery,' p. 391.

Hunter showed that the comfortable condition which we call *Health*, was the result of observing certain rules of life; and that

the undesirable condition called *Disease* was the result of the neglect or infringement of those laws.

In this way, he laid the foundation of those great advances which are now going on so rapidly—those, namely, which elucidate the laws of hygiene, and tend to prevent the generation and the spread of disease.

39. The following anecdote was often repeated by the late Dr. Garthshore, a physician of the old school, and intimate with Hunter. 'One morning, finding Mr. Hunter very busy in his collection, I observed, "Ah! John, you are always at work." "I am," replied Mr. Hunter; "and when I am dead, you will not soon meet with another John Hunter." Whoever was acquainted with the parties, will never suspect that this sentence implied more than that, if his whole collection should not be in order during his lifetime, it would be accomplished with great difficulty after his death.'—'Memoirs of J. Hunter,' by J. Adams. London, 1818, p. 260.

40. See a 'Memoir of Callender,' by Sir James Paget, Bart., in the 15th vol. of 'St. Bartholomew's Reports.'

41. 'Schools Inquiry Commission,' vol. i. 'Report of the Commission,' 1868, ch. i.

In further support of this statement see an 'Address to the Students of the Westminster Hospital,' by Dr. Dupré. 'Lancet' for 1879, vol. ii. p. 498.

Dupré says: 'Looking back to his school-days he could remember the enthusiasm with which the advantages of a so-called technical education as opposed to the old classical education were supported by many great scientific men of the day, and foremost among these by *Baron Liebig*.

'The effect of this movement was such that for a time, at least, classics were considered only secondary in importance as a factor in education.

'But a reaction took place, and *Liebig* himself admitted in after years, that, among his own students, those who had received a classical education were superior to the rest.' . . . .

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