

**Introductory address delivered at St. Thomas's Hospital, October 1st, 1889
/ by William Anderson.**

Contributors

Anderson, William, 1842-1900.
Royal College of Surgeons of England

Publication/Creation

London : Printed by Adlard and Son, 1889.

Persistent URL

<https://wellcomecollection.org/works/zbaa2mmt>

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>





Digitized by the Internet Archive
in 2015

<https://archive.org/details/b22304630>

8
INTRODUCTORY ADDRESS

DELIVERED AT

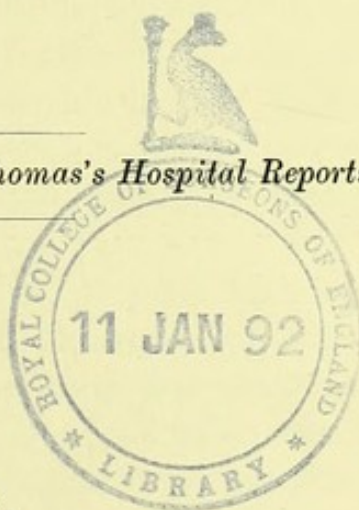
ST. THOMAS'S HOSPITAL

OCTOBER 1ST, 1889.

BY

WILLIAM ANDERSON, F.R.C.S.

Reprinted from Vol. XVIII of the 'St. Thomas's Hospital Reports.'



LONDON:

PRINTED BY

ADLARD AND SON, BARTHOLOMEW CLOSE.

1889.

INTRODUCTORY ADDRESS

BY ST. THOMAS BOGERT

OCTOBER 1, 1882

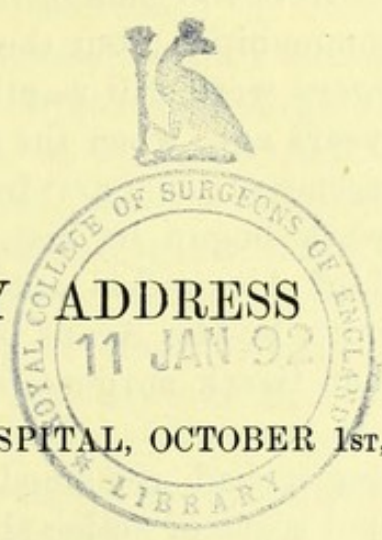
ST. THOMAS BOGERT

ST. THOMAS BOGERT

ST. THOMAS BOGERT

ST. THOMAS BOGERT

1882

The crest of the Royal College of Surgeons of England, featuring a lion passant guardant, is positioned above a circular library stamp. The stamp contains the text "ROYAL COLLEGE OF SURGEONS OF ENGLAND" and "LIBRARY" around the perimeter, with the date "11 JAN 92" in the center.

INTRODUCTORY ADDRESS

DELIVERED AT ST. THOMAS'S HOSPITAL, OCTOBER 1st, 1889.

BY WILLIAM ANDERSON, F.R.C.S.

MR. TREASURER and GENTLEMEN,—I have been induced to adopt as the subject of the address I have the honour to deliver to-day the history of European surgery, because it appeared to me that it is capable of conveying useful lessons for those who are upon the threshold of our profession. It is of course obvious that in the brief time at my disposal I can only deal with a limited period in this history, and with the broader outlines of progress, and I must beg your indulgence for all the imperfections and omissions which are inevitable in an attempt of this kind.

I propose to depict briefly, by way of introduction, the state of surgery at the close of the Middle Ages. I will then endeavour to describe the rise of the New European School upon the ruins of the Greek and Græco-Arabic teaching during the sixteenth century; to trace its progress through the succeeding cycles down to the present time, showing how far and by what means we have advanced step by step in front of the position held by our mediæval ancestors; and finally, to examine how we in the present may learn to profit by the experience of the past.

Surgical knowledge in some form or other has probably

existed from the time of the earliest associations of mankind into communities ; but the foundations of a scientific study of surgery were still wanting until two thousand three hundred years ago, when the genius of Hippocrates commenced the rescue of our art from superstition and empiricism. The work begun by him, was carried on by pupils of the school of Alexandria until the capture of the city of the Ptolemies by the Arabs in the seventh century of our era, and then Greek surgery fell from its high intellectual state, never to rise again. During the eleven hundred years of its progress it had remained essentially Greek, although the principal scene of action shifted as time went on from Greece to Rome, and from Rome to Constantinople ; and its most brilliant leaders, Hippocrates, Herophilus, Archigenes, Galen, Heliodorus, Antyllus, Leonides, Aëtius, and Paulus, were all of Hellenic blood. Though fallen, however, it was not dead. The conquerors became zealous students of the philosophical and scientific lore of the conquered, and it was through the Arabs that the lessons of Hippocrates and the Alexandrian school were transmitted, emasculated and in Oriental guise, to Spain, Italy, and the rest of Europe in the course of the Middle Ages, there to hold a feeble but unchallenged sway till near the end of the fifteenth century.

Surgery was in evil case at the close of the mediæval period. The surgical teachings bequeathed by the Arabs in the days of their activity, were but a *caput mortuum* of Greek and Hindoo practice, for the Moslems, while approving timidly of the bold procedures described and carried out by their Hellenic and Indian predecessors, feared to repeat them. Their religious prejudices at once limited their researches and served as a cloak for their want of courage, and not only was the study of gynæcology, which had reached a high point under Soranus of Ephesus, permitted to fall into utter neglect, but we find one pure spirit meekly deprecating the performance of lithotomy because it involved the exposure of parts upon which the eye of the true believer could not rest without sin—and of such was the kingdom of the Mahommedan heaven.

In their hands surgery could not but sink ; yet in the middle and later part of the Dark Ages the medicine and sur-

gery of Rhazes, Haly Abbas, Avicenna and the others were the best that could be had, and possessed at least some tincture of science and philosophy. But Græco-Arab surgery did not pass outside a contracted circle of students, and for the masses of the people in England, France, Germany, and other parts of Europe the only available treatment in surgical ailments was that afforded by the priesthood, whose methods were for the most part pre-Hippocratic; by stationary or peripatetic quacks; by barbers; and even in some countries by executioners, who had acquired a curious experience in remedying the injuries and deformities which in their official capacity they were called upon to inflict.

Let us now try to picture an educated surgeon of the end of the fifteenth century. He must not be confounded with the unlettered barber-surgeon, for whom he cherishes a profound contempt not unmingled with jealousy. He is a man of respectable antecedents and of some culture; grave and stately in bearing, clerkly in attire, sententious in utterance, and ready to quote Latin aphorisms with the best. Trained in a recognised school of medicine, such as Montpellier, Naples, or Salerno, he has learned all that his books and teachers can tell him, and has been brought up in the conviction that nothing else is worth the knowing. His library is not a large one, but the printing press has already furnished him with such standard texts as the Aphorisms of Hippocrates, the works of Galen, and the compilations of the Arabs, especially of Avicenna; all in the form of Latin translations, for our surgeon understands neither Greek nor Arabic. He might also possess a copy of Celsus; and amongst the moderns his favourite authors are the 'Four Masters' in their 'Gloss upon Roger of Palermo,'—Theodoric of Bologna, Bruno of Calabria, William of Saliceto, and Lanfranchi of Milan; but his most trusted mentor in practice is the standard text-book by the famous Guy de Chauliac, written in 1346. This was only 150 years old, and quite on a level with the latest requirements; for ideas did not race at break-neck pace in the good old days as with us of the nineteenth century, who in our pride of progress, dismiss as effete the handbooks of the last decade, to accumulate the

dust of oblivion in the dishonoured exile of the shelves of the second-hand dealer. So much for his literary material. The implements of his craft are no more varied or modern, and comprise little beyond a knife or two, scissors, saws, forceps, needles, probes, a catheter, a set of trepans with elevators, lenticulars, and other instruments for treatment of head injuries, a chisel or cutting nippers for the amputation of gangrenous parts, a liberal variety of cautery irons, and a supply of bandages and splints, with perhaps some cumbrous apparatus for the reduction of dislocations. Finally, he is the owner of numberless formulas for plasters and salves, many of which are trade secrets, and are treasured as the most precious of his resources.

His practical attainments are restricted. As an anatomist his knowledge is essentially theoretical, despite the experience of a few cursory demonstrations upon the dead subject to which he has listened in his medical school, and perhaps an acquaintance with the writings of Mondino, who had made some original observations upon human anatomy nearly two centuries before ; but he knows little or nothing of anatomical topography, and could not for his life put his finger upon the main artery of a limb. In more abstruse fundamentals, however, he is of over-powering wisdom : he knows the exact share that should be taken by the elements—fire, air, earth, and water—in the composition of the body, and everything concerning the four humours—blood, lymph, yellow bile and black bile, with their several properties of heat and coldness, dryness and moisture ; and will sort his patients into their temperaments—sanguine, lymphatic, bilious, and melancholic—with that sense of satisfaction which the mediæval intellect seems to have experienced in the achievement of empty theoretical classifications of every kind. He is of course a humoralist in pathology, and will expound, for example, how cancers are formed by black bile overheated, and how their incurability is due to the thickness of the peccant humour which prevents them from being either repelled or discussed ; and in a similarly lucid manner he will decide, to his own contentment, upon the nature of any ailment that may be brought under his eye.

As a surgeon his business lies mainly with contusions

and wounds, burns and scalds, and sores of all kinds. He may indeed be consulted upon any surgical disease or injury, but he has permitted fractures and dislocations to pass almost entirely into the hands of the bone-setter, and operations for hernia, cataract, stone in the bladder, and for plastic restoration of lost noses or lips, to revert to the quack specialist, while bleeding and tooth extraction have come to lie more particularly within the province of the barber-surgeon. His operative functions are reduced within very narrow limits. The Greek surgeons have taught him how to reduce dislocations ; he can remove portions of the cranium skilfully enough in cases of injury or medical disease, though without any fixed laws to direct the occasion of his interference ; but tumours he generally treats with poultices and plasters ; strangulated hernia he fails to recognise as such, and leaves the patient to die unrelieved ; resection of diseased bones and joints, as practised by Antyllus and Heliodorus, he has probably heard of, but will never tempt Providence by venturing upon anything of the kind ; and his amputations are confined to gangrenous parts, as in the days of Hippocrates, unless he determine to operate after the manner of Guy de Chauliac, by tying a tight ligature around the limb and allowing it to drop off by a process of mortification. He may also be able to cure a fistula by the knife or ligature, but even here the empiric specialist is his rival.

In the management of contusions and wounds, however, he is on his own ground, and it will be interesting to see in what his treatment is likely to consist. For ordinary bruises he will be content to apply plasters, the ingredients of which vary with the means of the patient, for he openly avows one surgery for the rich another for the poor ; for very extensive contusions the remedy most highly advocated is to bury the sufferer up to his neck in horse-dung. For a recent wound he has the choice of two opposite courses, each supported by great authorities : to keep it open with a view to avert imposthumations and other evil sequences, and this practice he always follows if he believes a tendon or nerve to be injured ; or to secure immediate union by means of stitches or bandages. In either case his plasters and salves

will be employed as agents essential to the cure, but he understands the great surgical principle of rest, and has received from Galen excellent advice on the subject of cleanliness; hence under ordinary conditions his results are probably good. Should, however, a large vessel be implicated, his troubles begin in earnest, for he is terribly afraid of the sight of blood unless drawn *secundum artem* from a properly selected vein, under a suitable sign of the zodiac and phase of the moon. And yet his books have given him abundance of counsel. If a man of ready resource, he might clap his finger upon the bleeding point and then apply a tight compress, as once did Guy de Chauliac in a moment of inspiration and to his great renown; or he might try to sew up the vessel, or tie it above and below the lesion dividing it between the two threads as the Greeks advise, but he would rarely have the courage to face the long and sanguinary exploration necessary to carry this excellent principle into effect. His sheet anchor is the actual cautery, and where that fails it is to be feared that the patient's prospects are gloomy indeed, for the best further advice that his authors have given him is to open a vein in a remote part in order to lessen the flow of blood to the wound, or, this failing, to endeavour to act through the sufferer's imagination, by turning his attention from the injury and then telling him cheerfully that "the bleeding is no more, and that he was but fleeced for his health," for thus, his natural strength is reinforced and the blood is stanchèd—at least, so says Jerome of Brunswick. The hæmorrhage at last arrested, our surgeon would dress the wound with a restrictive salve composed perhaps of dried earth-worms in powder, bole armeniac, camphor, oil of roses, and sundry other ingredients—an excellent prescription of Jerome—and he might insert a drainage-tube of reed or animal membrane—the windpipe of a rabbit perhaps—after the manner of Roger and the Four Masters. Most of this we should esteem a weakly surgery in the nineteenth century, and it would have been equally despised by the Greeks in the early part of the Christian era, but our mediæval surgeon nevertheless did good in his generation, and his faults were those of omission rather than of commission. His main defects

of education were the unsatisfactory state of his physiology and pathology, and his imperfect knowledge of practical workaday anatomy : but it was an intellectual disqualification that formed the most serious bar to his progress—an ineffable confidence in the soundness and sufficiency of his own learning and practice. For him all the reasonable potentialities of his art were comprised within the two covers of the compilation of Guy de Chauliac. If indeed there was a single weak point in his armour of self-satisfaction, it was an unconfessed misgiving that any stroke of his knife might bring upon him a rush of blood which he could not see his way to arrest, or, having checked it, to prevent its return so soon as reaction set in, or when his cautery sloughs were cast off ; and his only way to silence inward reproach was to evade as far as possible all operations which exposed his patient to danger and himself to discredit. It would be painful to guess at the number of lives that have been sacrificed within the historical period of surgery by this ineptitude, either through hæmorrhage that the merest tyro could now control with ease, or through diseases which were allowed to go on to the bitter end because they appeared less terrible than their only remedy, the knife of the surgeon.

At the present day, when, with our knowledge of the course of the vessels and our armament of forceps, elastic bandages, tourniquets, and the rest, we are able to remove an entire limb with less blood-letting than our forefathers would cheerfully undergo in due season as a tribute to general principles of sanitation, we are apt to think harshly of the terrors of the old-time surgeon ; but before risking an injustice it is well we should remember what Charles Kingsley said to a person who was declaiming against the stupidity of the idolatrous heathen. " Let me tell you, sir," he blurted out with his impetuous stammer, " that if you had had a chance you would have done the same and worse. The first idols were black stones, meteoric stones. And if you'd been a poor naked fellow, scratching up the ground with your nails, when a great lump of pyrites had suddenly half buried itself in the earth within three yards of you, with a horrid noise and smell, don't you think you'd have gone down on your knees to it and begged it not to do it again, and smoothed it and oiled it, and any-

thing else?" The application is plain. We, thanks to the inspiration of a master mind, and the thoughtful researches of a few able experimentalists, have learned what to do, but had we lived 500 years ago and been confronted with a mighty blinding gush of blood from the wound that we ourselves had made, we might have gone down on our knees before it, figuratively at least, and dabbed it with useless styptics, and pushed red-hot irons into it, or poured on boiling pitch, or anything else, just as Aëtius and Paulus and many another good man did ages before us. So we will be thankful, and not arrogant, since we know better.

I have now spoken of the surgical knowledge at the close of the Middle Ages, in the hands of a man of good general education and one who has profited by the best opportunities of professional training within his reach. Of such men there were many in Italy, where surgery was always an honoured pursuit; a few in France, where the Universities of Montpellier and Paris taught the Græco-Arabistic medicine, and where the purely surgical College of St. Côme (founded in the thirteenth century) had done some useful work under Lanfranchi, the Milanese; but there were none of any note in Germany, except in Strasburg, where Jerome of Brunswick, led the way, or in England since the time of John Arderne. Nine tenths, or perhaps we should say ninety-nine hundredths, of the surgery of Europe was under the administration of a very different set of persons. During the earlier centuries of the Middle Ages the practice of medicine and surgery had almost everywhere fallen partly into the hands of the priesthood and partly into those of illiterate quacks, and in either instance had generally reverted to prehistoric methods. Very few men were competent to read the Greek classics; there were no Latin translations of the Greek masters of medicine until the eleventh century, when Gariopontus introduced some compilations, mostly Galenical, into Salerno; and the Jews, who knew Arabic and were for a time the only persons able to profit by the writings of the Arab physicians, were placed under every possible disability by the fierce opposition of the Catholic clergy.

Under these circumstances, the knowledge of the monks down to the twelfth century could rarely be anything but

scrappy and empirical, and their surgical operations probably did not go far beyond blood-letting and tooth extraction, in which they were aided by the barbers. Their operative surgery, however, such as it was, had to be abandoned after the edict of the Council of Tours in 1163—for the hieratic conscience that provoked and fomented the murderous “holy war” of the Crusades then saw fit to pronounce that bloodshed was incompatible with the divine mission—and this section of their medical practice fell naturally enough into the unsanctified hands of their tonsorial assistants, who thereupon began to combine various surgical ministrations with the trimming of hair and beards. It was not in the nature of things that barber-surgery should flourish quickly, but as time went on a number of men who showed more aptitude for the work than their fellows, attained sufficient reputation to justify them in sacrificing altogether the comfortable certainties of barbering for the treatment of such injuries and external ailments as fell to their lot. Some of the number were drafted into the army as field surgeons, and in Germany were expected to shave and trim the hosts as well as to look after their bodily complaints; in France and England also the military surgeon appears to have had a similar origin, but he was less degraded, and his ambition rose. The important surgical College of St. Côme in Paris (1260) is said to have been established by barber-surgeons who had acquired experience and influence in the wars, and the same may be said for the Fellowship of Surgeons in London nearly two centuries later (1435), and the ephemeral Faculty of Physicians and Surgeons which preceded it by about a dozen years, but in both countries the founders, emancipated from barbering, forgot their origin, and by ignoring the claims of their former fellows, and encroaching upon the privileges of the physicians, raised a combination against themselves, which defeated their efforts to elevate the standard of their profession. The day of the barber-surgeon was yet to come, but his connection with his associates, the barbers, soon became a nominal one—the barbers proper, in the Barber-Surgeons’ Guild, being separated from the members who practised surgery even as early as the fifteenth century, and the latter were put back into the ranks of the barbers only when

found wanting in the higher calling. We shall see how, step by step, the low-born, uneducated craftsmen gained strength, and how at length they became the history makers of modern surgery, while Italian surgery, which had so long maintained the dignity of the art and deserved a better fate, was destined to fall into the background. We may, if we wish, claim our descent from fellowships of surgeons like those dedicated to St. Cosmus in France and England, but it was not to the members of these associations, but to the unsophisticated barber-surgeons, that we owe the first of those advances which have raised surgery from a craft to a science.

The position of women in relation to surgery at the close of the Middle Ages calls for some remark. In the school of Salerno they were admitted to all the privileges of the sterner sex, and one, Maestra Trotula, in the eleventh century, attained great reputation and wrote a book, but her surgical contributions were of no importance; there is evidence, moreover, that women were admitted to practise in London in the fourteenth century; and in the Dublin Guild of Barber-Surgeons, established in 1446, they were also entitled to share in the privileges of the foundation. In addition to these strictly professional 'persons' there was a good deal of amateur surgery prevalent amongst women of the higher classes throughout Europe. We learn through mediæval stories, such as 'Amadis de Gaule' and the Arthurian romances, that the heroine was usually ready to bind the wounds of her lover and to apply the soothing balm; and knowing what we know of the practice of the professed leech, we may perhaps consider that the knight might have fallen into far less safe and gentle hands.

With the modern era began the new life of surgery. As we have seen, the promise afforded by the condition of the art at the close of the Middle Ages was very slender, but influences were already at work that were destined to replace the surgery of tradition and booklore by a science founded on personal experience and new observations. The revived study of the Greek and Roman writers, facilitated by Latin translations and spread abroad by the new-born press, did

something to improve the literary tone of our surgical records, but it lent a kind of polemical armour-plating to certain grave errors of practice, and on the whole, the veneration for the classical authors during the sixteenth century was a stumbling-block in the way of progress. On the other hand, the study of anatomy by dissection of the human subject, commenced in Italy in the fourteenth century, had really laid the foundations for a new departure, but the good effects were not to become apparent until long after. The real forces which urged the surgeon of the new period forward, almost in spite of himself, were two great calamities: the use of firearms and the importation of syphilis. Cannon were employed by Edward the Third against the Scots as early as 1327, and even at an earlier date by the Arabs, but it is probable that the enemy were more frightened than hurt by the maiden essays of these primitive 'manjaniks' and 'crakys of war.' At any rate it was not until the second half of the fifteenth century that gunshot wounds were sufficiently common to call for any special surgical notice.¹ Syphilis, which invaded Europe about 1494, soon carried its ravages swiftly through all countries and all classes, and as its more obvious manifestations were external, its treatment fell mainly into the hands of the surgeons, and especially the barber-surgeons, who were the chief representatives of dermatology at the time. Here then were two surgical conditions in which trade nostrums and the lore of the ancients were alike useless, and consequently the surgeon was forced to think for himself, and to draw the iconoclastic conclusions that there were some things which Hippocrates, Galen, and Avicenna did not know. Another advantage which he derived was that many patients of rank and influence were thus brought under his care and their gratitude often aided his social elevation.

The early study of gunshot wounds did not lead to good

¹ The first surgical account of gunshot wounds is contained in the 'Bünd Ertzney' of Heinrich von Pfolspeundt, written about 1460, but never printed. A short chapter of the 'Hantwirckung der Wundartzney' of Jerome of Brunswick, published in 1497, is devoted to the same class of injuries. Other surgeons who added to the early literature of the subject in the first half of the sixteenth century, were the Italians Benedetti, Vigo, Berengario da Carpi, and Maggi, and the Germans Hans von Gersdorff and Felix Würtz.

results. Most of the observers, struck with the ugly aspect and unfavorable complications of the new injuries, came to the conclusion that they were poisoned, and that the venom must be got rid of before the damaged tissues could be brought into a condition for repair. Hence the orthodox practice was either to draw a hair rope along the track of the missile, to inject boiling oil, or in other ways to complete the work of the enemy's guns and cannons. The first to demonstrate the fallacy of this dismal theory was a French barber-surgeon named Ambroise Paré, and his suspicion of the truth was the result of one of those accidents of which only clever men are able to take advantage. On one occasion on the battle-field, he tells us, the supply of boiling oil ran short, and consequently many of the wounds were left without the customary torture. The next morning when, with great misgivings, Paré visited the patients, whom he expected to see writhing under the effects of the deadly virus he had left to work its will, he found them apparently better for his neglect than others before them had been for his attentions.¹ An ordinary man might at once have applied a double dose of the omitted medicament to compensate for lost time, but Paré preferred to leave well alone, and moreover decided to repeat the fortuitous experiment. This he did with confirmatory results, and thus was taken the first great step on the road to surgical success—to avoid doing harm.

Military practice brought a new demand upon the surgeon's skill. In the old days the injuries, which were inflicted mainly by cutting and pointed instruments, seldom appeared to call for amputation as a means of preventing death, and hence the operation was rarely attempted in the field during the Middle Ages. With the introduction of firearms, however, the circumstances were altered, and in spite of the dangers attached to the remedial use of the knife, the sur-

¹ "La nuit ie ne peus bien dormir à mon aise pensant que par faute d'auoit cauterisé ie trouuasse les blessez (ou i'auois failly à mettre de ladite huile) morts empoissonnez, qui me fit leuer de grand matin pour les visiter. Où outre mon esperance trouuay ceux ausquels j'auois mis le medicament digestif [used in place of the boiling oil] sentir peu de douleur à leurs playes sans inflammation & tumeur, ayans assez bien reposé la nuit: les autres ou l'on auoit appliqué ladite huile, les trouuay febricitans avec grand douleur, tumeur, & inflammation aux enuirs de leurs playes" (*Œuvres*, p. 264).

geons perceived that in some instances the life of the wounded man depended upon the removal of the mutilated limb. The mortality from hæmorrhage in the earlier operations must have been terrible, for the boiling pitch, red-hot irons, styptic pellets, and other means of arresting the loss of blood, were quite inadequate, even though the amputation was rarely carried above the knee or elbow. But a new thought struck Ambroise Paré like an inspiration from Heaven—to seize the divided vessels and tie them with all possible speed. It is this one idea that was destined to change the aspect of surgery. The right of Paré to the discovery has often been disputed, because the Greek surgeons had already employed the ligature for wounded vessels, and the mediæval surgeons had quoted the Greeks, but the writings of the ancients appear to show that they did not tie arteries divided in the course of an amputation, but, like their successors, trusted mainly to the actual cautery. However this may be it is certain that at the time Paré knew nothing whatever about the Greeks, for he was a self-taught man, and his opportunities for the acquisition of book learning did not come until late in life. His two methods of ligature were far from perfect, but in his hands and those of his pupils they served their purpose, and were so incalculably superior to all the hæmostatic measures that went before, that it is almost with amazement we find his successors for nearly a hundred years after his lesson obstinately clinging to the heated irons and other barbarities of their early forefathers. Even the English surgeons of the Elizabethan period, good men and true, who knew what Paré had done, held aloof from his practice ; but to do them justice it must be said that while refusing to imitate his practice they refrained from abusing the man and his method, as did some of his own countrymen who were incapable of understanding either.

The restoration of lips, ears, and noses that had been subjected to penal mutilation was a very ancient branch of surgery, and one in which the Hindoos had attained great proficiency, perhaps before the days of Hippocrates. The operations, however, fell almost entirely to specialists. In the fifteenth century the most famous practitioners of this

section of surgery were the Brancas, father and son, of Catania, in Sicily. The Hindoos had restored the nose by means of flaps taken from the forehead or cheeks, and the same methods were employed by the Greeks and Romans, but the younger Branca invented the plan that became familiar a century later through the writings of the Bolognese surgeon Tagliacozzi, and has recently been once more revived: to borrow the new skin from the arm of the patient. It is said that some of the Italians resorted to the buttock of another person for the raw material, and from this practice arose the popular superstition adverted to in Butler's well-known verse, ingeniously applied in modern times by Edmond About in '*Le Nez d'un Notaire*,' attributing to the transplanted integument in its altered situation a mysterious sympathy with the individual from whom it was taken:

"But when the date of Nock was out,
Off dropped the sympathetic snout."

The practice of the Brancas was carried on through the sixteenth century by a family of Calabrian surgeons, and Tagliacozzi, who is often looked upon as the father of plastic surgery, did little more than repeat and publish the operations that had long been traditional in his country.

The remaining steps in this century related to improved methods of removing stones from the bladder (the Marian and the supra-pubic operations), to the radical cure of hernia without castration, and to the surgical relief of intestinal strangulation in hernia. The hero in the latter case was a French surgeon, Pierre Franco, who was also the second performer of lithotomy by the supra-pubic incision.¹

The chief honours of the new surgery down to the end of the sixteenth century rest principally with the Frenchmen Paré and Franco. England played but a small part in the actual progress of surgical science, and yet there were some sturdy members of the Barber-Surgeon's Guild who rendered very good service to their countrymen. The first of these was Thomas Vicary (1495—1561), who held the post of

¹ The first 'high' operation was performed in the fifteenth century, by a French specialist named Colot, who obtained permission to make the experiment upon a condemned criminal. It was successful, although it is said that the intestines escaped from the wound.

sergeant-surgeon to Henry the Eighth, Edward the Sixth, and Queens Mary and Elizabeth, and that of senior surgeon to St. Bartholomew's Hospital, and who was also the first master of the London Barber-Surgeons' Company : a man who won the respect of all his associates and did much towards the social elevation of his calling. He was the author of a book on anatomy, perhaps the worst compilation of the kind ever published, but it was sanctified by the good intentions of the writer, and won a *succès d'estime*, reaching a second edition in 1577, sixteen years after his death.¹ His contemporary, Thomas Gale (1507—1586) an army surgeon, was the author of the first book on general surgery printed in our country,² a work of great interest ; and a little later three other military surgeons, William Clowes (1540—1604), John Woodhall (born c. 1569), and John Banister (1546—1608), contributed importantly to surgical literature ; Clowes by a treatise on gunshot wounds and syphilis, Woodhall by a noted volume on surgery, and Banister by a curious work on anatomy 'For the Utilitie of all Godly Chirurgians within this Realme' (1578).

The position of the surgeon, always high in Italy, remained in a very unsatisfactory state in Germany (except in Strasburg), and was only beginning to mend in France and England. In France the improvement was mainly due to the influence of Ambroise Paré, who had won the personal regard of his monarch and of all the great men of the time who knew and could appreciate his mind and character. In England the result was due to the consolidation and augmenting power of the London barber-surgeons. The guild, which had been incorporated as early as 1462, received from Henry the Eighth in 1540 a new and important charter ; an act commemorated by Holbein in the great picture which is still in the possession of the Barber-Surgeons' Company. The Fellowship of Surgeons, who had made a valiant effort to elevate the practice and

¹ A reprint, with commentaries, has recently been issued by Mr. Furnivall for the Early English Text Society.

² The first surgical writings by an Englishman appear to be those of John Arderne, a contemporary of Chaucer. An interesting account of his life and works by Dr. J. F. Payne will be found in the 'Dictionary of National Biography.' His treatise on 'Fistula in Ano' has been printed, but the rest remains in manuscript, a copy of which may be seen in the British Museum.

social estimate of surgery, found themselves unable in the absence of any leaders of commanding position or ability to attain their end, and judiciously determined to take advantage of the moment to join their waning forces with the waxing power of their old and once despised rivals. The term "barber-surgeon" was now indeed a misnomer for the surgical members of the Company. Even in the charter of 1462, the barbers, the older element in the association, were passed over in silence, and before the time of the newly constituted company in 1540, although the nominal connection was unsevered, the distinctions between surgeons and barbers had become as great as that between lawyers and shoemakers.

In 1556 further powers, as an examining and licensing association, were conferred upon the Company. This admission of the position of the surgeons as a scientific body was pregnant with results, but for a long time, although they were no longer classed, as in the acts of the early part of the century, with bakers, brewers, and scriveners there was still much to be desired. Even the good Thomas Gale, writing in 1563, admitted that the surgeons of his time were rude and unskilful, and tried chiefly to accumulate prescriptions. The company, however, were doing their best to further the cause of medical education by giving periodically a course of public demonstrations of anatomy in the hall, lasting for three days and finishing, according to the fashion of City Companies, with a dinner. It was ordained too, in 1566, that apprentices to members of the livery should not be taken unless they knew how to read and write and were approved by the masters as 'Clene in person and Lymm' and otherwise 'mete for the exercise of their craft.' Examinations for all candidates for a licence to practise surgery in London became necessary after 1582 (as in the Neapolitan realm after 1134), but the examiners were not too exacting in their demands, for temporary and partial licences were granted—for a consideration—even to quack specialists; and the bone-setter, rupture-cutter, or cataract-coucher, might obtain his certificate in his own branch for a year or term of years if able to satisfy the masters that he was not utterly a knave and impostor. The internal government of the association was very paternal. Like the College of

Physicians, they had the power to despatch a faulty member to gaol until he had purged his offence, or in milder cases to administer a reproof or impose a fine. An example is afforded by the records of the Barber-Surgeons Company for 1575.¹ In this year a member of the livery had not only allowed his patient to die, but scurrilously ventured to proclaim that the fatal disease had been communicated to him by his wife. The maligned woman having complained to the Company of the libel the surgeon was summoned before the masters, and in the presence of the court, and of the plaintiff and her neighbours, who were called for the purpose, was ordered to ask forgiveness upon his knees. This he did ; rising, let us hope, a wiser and a better man. Again, we read under the date of April 3rd, 1576 :

“ Here was a complainte against William More by one Henry Dobbys, for that he did not cure his sonne, but made the same worse.” A little later, on May 10th, comes the result, eminently satisfactory to all except to the defendant, that “ More was ordered to meddle no more with surgery, on account of his ignorance.”

Another business of the court was to effect an arrangement when a member, having, in accordance with a common practice of the time, taken a fee in advance for a promised cure, failed to carry out his share of the bargain ; and many quaint entries with reference to such matters might be quoted : for example : “ William Clowes was charged by William Goodnep for not curing his wife ‘ de Morbo Gallico,’ and yt was awarded that the saide Clowes sholde either geve the said Goodnep XXs or elles cure his saied wief, which Clowes agreed

¹ I must here take the opportunity to express my thanks to Mr. Sidney Young, of the Barber-Surgeons' Company, to whose courtesy I am indebted for access to many curious extracts from the books of the Association, and for much valuable information ; and to recommend all who are interested in the history of English surgery to read his forthcoming volume, ‘ The Annals of the Barber-Surgeons.’ Other extremely interesting details will be found appended to Mr. Furnivall's reprint of ‘ Vicary's Anatomy ’ (Early English Text Society) ; in the ‘ Memorials of the Craft of Surgery,’ by John Flint South, edited by Mr. D'Arcy Power ; in a contribution by Dr. Norman Moore in the ‘ St. Bartholomew's Hospital Reports,’ vol. xviii, “ The Physicians and Surgeons of St. Bartholomew's Hospital before the time of Harvey ;” and in ‘ London (Ancient and Modern) from the Sanitary and Medical Point of View,’ by Dr. G. V. Poore.

to pay the XXs, and so they agreed and each of them made acquittance of the other."

Before the end of the sixteenth century the Company exercised a censorship over the writings and opinions of its members; but we do not hear that they were as Rhadamanthine as were the College of Physicians, who actually summoned before them in 1559 one Dr. Geynes for having contended that certain propositions of Galen were wrong, and constrained him under penalty of a summary committal to gaol to recant his heretical and daring assertions. A wholesome law established by the guild in a very early period of its existence is also deserving of notice, the compulsory presentation by the members of any patients who were in danger of death, or otherwise progressing unfavorably; this 'presentation' being actually a consultation with experienced masters of the livery, who gave free of expense such advice as the case appeared to demand. Mr. D'Arcy Power tells us that the custom has survived by descent in a modified form in St. Bartholomew's Hospital.

The development of the new surgery was accompanied by a renewed study of the older writings. Careful translations from the Greek surgical authors were published during the fifteenth century, that of Guido Guidi, or Vidus Vidius, ('*Chirurgia e Græco in Latinum a se conversa*,' 1544), being one of the best known, and containing admirable woodcut illustrations; and while men like Berengario da Carpi, Vesalius, Eustachius, and Fallopius in anatomy, and Paré and Franco in surgery, worked to find out something that the ancients did not know, the great body of the more learned portion of the profession were divided, after the manner of the natives of Lilliputia, into Bigendians and Littleendians, quarrelling with wrath profane as to whether the Greek or the Græco-Arab was the preferential extremity at which to attack the egg of medical theory. We are informed in Dr. Payne's learned article on the History of Medicine in the '*Encyclopædia Britannica*' that in the sixteenth century a prodigious schism divided the whole Faculty upon the question of a rule of venesection,—whether the blood should be drawn from near to the affected organ, as advised by Hippocrates and Galen, or at a distance, according to the Arabs; and a learned professor of the University of Paris,

then a stronghold of Græco-Arab authority, having advocated the cause of the Greeks, was expelled the city, and his method formally prohibited by Act of Parliament. The controversy lasted for many years, involved several universities, brought down the thunders of papal and imperial intervention, and ended in the downfall of Arab medicine. For a long time, however, the works of the ancients were for the great majority of practitioners invested with a claim to veneration little short of that accorded to Holy Writ, and we may imagine what a shudder passed through the marrow of the orthodox when a firebrand like Paracelsus swore roundly that there was more learning in his shoe-buckles than in all that Galen and Avicenna ever wrote. Fortunately the cause of reform had a less suspicious champion than the half charlatan, half genius Switzer in the Florentine surgeon Benivieni, who, at the beginning of the sixteenth century, had proclaimed the doctrine that surgery should rest upon the basis of anatomical, pathological, and clinical observations, and that the moderns ought to set to work to extend the paths of science instead of pacing to and fro for ever the narrow and unfinished roads left by their predecessors, and did his best to establish the principles upon which depend the progress and prospects of the surgery of to-day. Even he was not the first to express dissatisfaction. Guy de Chauliac long before had made sarcastic remarks upon the mediæval compilers, who, he said, “*se suivent comme les grües* ;” but the person who is clear-sighted enough to perceive a fault is not always strong enough to correct it, and Guy himself, although he often diverged from the line of flight a little to one or other side, seldom lost sight of the tail of his leader. From this distance we see him only as a crane of somewhat stronger pinion than his companions, but essentially one of the Græco-Arabistic flock.

Surgical education in this century, despite the opposition of a few dissentients, went on in the old groove at Naples, Montpellier, and elsewhere. Some teaching was carried on outside the universities in surgical associations, such as that of St. Côme in Paris, and under the auspices of the Barber-Surgeons Guild in London, but it was of the most meagre description, and the hospitals were very little, if at all, utilised

for clinical instruction. St. Bartholomew's and St. Thomas's Hospitals were both furnished with new charters in the course of the century, but a modern student of St. Thomas's would have some difficulty in picturing to his imagination his *alma mater* in the Elizabethan days, when the governors kept a whipping-post and stocks within the precincts, and used them too, not indeed for pupils, for we do not know that there were any, but as a moral corrective for patients who had undergone at the expense of the charity the cure of such physical maladies as were contracted through their own vices, and as a warning to erring sisters who had offended against the canons of the institution.¹ St. Bartholomew's, under Vicary, Clowes, and Woodhall, may have been in better state, but it is melancholy to reflect upon the waste of material in these nobly purposed asylums.

Many of the surgical writings of the sixteenth century are very quaint and original both in style and matter. Up to this time it had been the custom to write medical works in Latin, but the barber-surgeon had no great affection for the dead languages, and wisely, though apologetically, ventured to express his views in the vulgar tongue. It was a great scandal, but Paré, Woodhall, Clowes, and the others outlived it, and the students of the French and English literature of this time have reason to be grateful for at least two remarkable examples of the transition from mediæval pedantry to the naturalistic and vigorous diction that stamped the dawning era of independent thought.

A perusal of the English group of surgical authors, of whom Clowes may be taken as the best type, is singularly refreshing after a course of the insufferably flatulent and arid discourses of many of the earlier and contemporary writers on medical subjects. Picturesquely figurative expressions strike us at every page; curious scraps of learning alternate with amusing colloquialisms and with practical information of the most matter-of-fact character; the author repeatedly takes the reader into his confidence, and naïvely

¹ See Mr. Rendle's account of St. Thomas's Hospital from 1200—1553, in the 'Transactions of the Royal Society of Literature' for 1882. He notes that one sister was ordered "twelve stripes, well laid on," but does not mention the offence which was met by so drastic a remedy.

recites his personal quarrels, quoting verbatim his victorious arguments against his unlucky opponents; he explodes abruptly into furious diatribes against quacks and critics, especially the latter; he proffers with anxious elaboration his reasons for every departure of practice which he considers peculiar to himself; sometimes he displays a foreshadowing of the puritanism of a later age; and occasionally, like Mr. Silas Wegg, he allows himself to drop into poetry—of the doggrel order.¹

The palm, however, in this period falls to Ambroise Paré as a surgical writer. He makes no pretence to elegance of expression, but his sentences are bright and logical and disclose not only an unsurpassed fund of observation and experience, but a kind of erudition which the prentice barber could scarcely have been expected to acquire. Like Vicary, he was a devout Christian, and from time to time improves the occasion by introducing pious reflections in prose or verse. He was, however, one of those who find no pleasure in turning the cheek to the smiter, for he could not restrain himself from bringing down rhetorical sledge-hammers to crush such insects as those who reviled him for his arrogance, indiscretion, temerity, and brutality in adopting the ligature in place of caustics, and for his presumption in doubting the virtues of unicorn's horn and mummy, all in face of the verdict of the ancients, with whom, said one "it is better that we should err than that we should judge rightly in opposition to their opinion."² By dint of much shrewd common sense he was able to dispose of many of the absurd super-

¹ Thus Mr. Clowes, whose muse is practical as well as fervid:

"When valiant Mars, with brave and warlike band,
In foughten field with sword and shield doth stand,
May there be mi(d)st a surgeon that is good,
To salve your wounds, and eke to stay your bloud.

To cure you sure he will have watchfull eie,
And with such wights hee meanes to live and die;
So that againe, you must augment his store,
And having this, he will request no more."

² "Qu'il faut bien que la licorne ait de grandes vertus veu que tous les sages demeurent entre eux d'accord des admirable proprieté d'icelle. Et que partant il faut acquiescer a leur autorité, attendu qu'il vaut mieux faillir avec les sages que bien opiner contre leur opinion."

stitutions of his time, but he could not entirely shake off the bonds of credulity, so that while he rejects the nonsense concerning the properties of the "corne de licorne" he accepts without question the evil interposition of Succubi and "nouveaux de l'aiguillette," and inserts in good faith the portrait of 'a very virtuous lady of great and ancient house,' who bore thirty-six children at a birth; as well as that of a wonderful pig of Liège with a human head and shoulders; but on the whole he was in advance of his time in this respect rather than behind it. In studying, however, his writings and those of the English barber-surgeons, it is easy to find some excuse for the irritation that then excited the minds of readers who had been accustomed to the terseness and grave dignity of the ancient texts. The style was undoubtedly of a less elevated type, and the soundness of the matter had yet to bear the test of general experience; hence we need not be surprised to find that two or three generations passed away before the work done by the stout pioneers of the sixteenth century was estimated at its real value.

This stirring time in the history of surgery was destined to be followed by a long period of inaction. The *seventeenth century*, although made resplendent by Harvey's discovery of the grand physiological secret of the circulation of the blood, which had escaped the research of Herophilus, of Galen, and all the great intellects of the Alexandrian school, was for surgery a kind of mediæval interval in the modern period, and there was little to record in the shape of progress beyond some further improvements in the treatment of gunshot wounds induced by the experience of two army surgeons, Magati, an Italian, and Wiseman, an Englishman. On the other hand, the work done in the past century was almost a dead letter. Wiseman, it is true, employed the ligature in his civil practice, but in field amputations he still preferred the actual cautery, and was less bold in his surgery than in his truthfulness and honesty; while in France the countrymen of Paré clung to the ancient methods as contentedly as though the great barber-surgeon had never written a line.

The origin of the famous lateral operation for the removal of stones from the bladder at the close of this term, as

related by Heister, is interesting as a picture of the time, and as an indication that the surgeons of the period were less bigoted and illiberal than they are sometimes represented to have been.

In 1697 an obscure monk named Jacques Beaulieu or Boulot, now known as Frère Jacques, came to Paris, in a very miserable condition, but bearing testimonials as to his skill in cutting for stone. At first his claims were treated with ridicule, but his earnestness and the evident integrity of his motives persuaded the surgeons to allow him to perform a test operation upon the dead body, which he accomplished with great celerity by means of a lateral incision corresponding in its essential features to that in use at the present day, but guided only by an ungrooved sound.¹ This won for him permission to repeat the operation in public upon a young tailor, and he extracted the stone so successfully that the patient was walking about without any bad symptoms before three weeks had elapsed. His skill was now so triumphantly demonstrated, at least to the satisfaction of the public, that patients flocked to him in ever increasing numbers, and the crowd of spectators attracted by his operations was so great that it was necessary to have a guard of soldiers to keep order. But when the first enthusiasm had died away it became apparent that the friar was a bad surgeon after all. He did not prepare his patient in any way, and he took no trouble over them afterwards, saying that it was sufficient for him to have extracted the stone, "God would cure the wound." After his first successes the mortality ran very high and most of those who did not die were grievously tormented by fistulas and other troubles, and consequently his reputation passed away almost as quickly as it came; not completely, however, for he continued to practise at Strasburg and elsewhere for many years, and after amending his method by employing a grooved staff in place of a common catheter (an improvement initiated by the French surgeons, Mareschal and Méry) his results underwent a material change for the better. It was in all probability to this empiric that we owe

¹ A previous and better operation devised by a German surgeon, Fabricius Hildanus, however, merits the honour of having anticipated the modern lateral method, but it appears to have attracted little attention.

the operation from which such brilliant results have been attained by Cheselden and others in later times.

Several other interesting items fall to the credit of the seventeenth century, some of them foreshadowing the greater achievements of a subsequent day.¹ There were, however, two operations which in their frequent and indiscriminate application reflected grave discredit upon both medicine and surgery. These are venesection and trephining. The use of venesection as a therapeutic measure had been strongly advocated by most of the ancients, and it was they who framed the rules, almost Chinese in their complex wrong-headedness, which guided the choice of the vessel to be opened and the circumstances of temperature, season, and phases of the moon under which it was supposed to be eligible or ineligible, but it was reserved for the physicians of the sixteenth and seventeenth centuries to carry their principles to the extreme of logical absurdity. Botallo in the sixteenth century had not only introduced free bleeding in all fevers, but even taught that the periodical use of the lancet was a desirable measure to ensure the conduct of a normal pregnancy to its natural conclusion, and in the period under consideration phlebotomy, supported by purgation on the

¹ The chief of these are the invention of the principle of the tourniquet by Fabricius Hildanus and its further development by Morel (1674); the revival of tracheotomy by Fabricius ab Aquapendente; the first recorded gastrostomy for the removal of a foreign body from the stomach by Shoval (1635); the excision of the tongue by Pimperelli (1658); the application of direct compression to aneurysmal tumours by Wiseman; the ligature of the femoral artery in the groin for a false aneurysm in the thigh by Severino; the performance of myotomy for deformities by Minnius; the revival of lithotomy by Ciucchi, whose instrument anticipated that of Civiale; the revival of sequestromy by Scultetus; the formation of a single long flap in amputation by Lowdham (1679); the transfusion of blood in anæmia and other conditions by various experimenters (on the dog by Wahrendorf in 1642, on a criminal by Wren in 1656); the treatment of strangulated hernia by dilatation of the constricting tissues by Thevenin (1696); the operation of external urethrotomy; digital compression of aneurysm after ligature by Bottenhuit (1658); the closure of vesico-vaginal fistula suggested by Roonhuysen (1663); the recognition by Wiseman of the advantages of primary amputation in gunshot wounds; the explanation of the seat of cataract by Quarré and Lasnier; the researches of Aselli and Pecquet on the lymphatic system; and the description of the valves of the veins by Fabricius ab Aquapendente, who thus left the discovery of the circulation of the blood almost open to induction.

right hand and emesis on the left, was the very palladium of medicine. We all know the biting references of Molière to the depletory practices of his time, and the recently published *Life and letters of Charlotte Elizabeth, the sister-in-law of Louis the Fourteenth*, offers a notable illustration in the treatment of her husband, the Duc d'Orleans, who on his death-bed was bled three times, was forced to swallow eleven ounces of emetics, a quantity of Schaffhouse water, and two bottles of "English drops." It appears almost superfluous to tell us that this was his "lit de mort." In surgery also the same practices were very much abused, but as a rule with less evil results, because the patients were for the most part in a better state for recuperation than those of the physician. Even Wiseman, who was distinguished above all things for his strong common sense and freedom from prejudice, did not rise above his time in this respect. To take a case at random from his works. He tells us of a young man who, having been "shrewdly cudgelled about the pate," was naturally found somewhat bruised as to his cranium, and not a little confused as to his ideas. To remedy this condition of things he was bled first in one jugular, then in the other, purged freely, his shaven head rubbed with embrocations, poulticed, and fomented; his diet reduced to water-gruel and "panado," and his body "kept soluble with clysters" for seven long days, after which his surgeon "gave him more liberty and purged him." "And thus," says Wiseman, "all external contusions may be happily cured."

As for the trephine, it was a common practice to prescribe the operation for the cure of headache, and Philip William, Prince of Orange, is said to have had seventeen circles of bone taken out of his cranium at different times by order of his physicians. In surgery, too, it was employed freely and without any definite principle, and although surgical reports are silent as to the evil results that may have followed, there can be little doubt that much needless mischief was occasionally perpetrated.¹

¹ One interesting anticipation of modern practice is, however, found in a small volume of little general merit, by Hugh Ryder, published in 1685. An injury over the motor area of the left hemisphere of the brain had caused a paralysis of the right arm, head, and tongue. This condition persisting, the trephine was

The old superstition of touching for the "king's evil" still survived both in England and France. Wiseman, as body-surgeon to Charles the Second, was perhaps officially bound to believe, and this he did, as he did most things, with much heartiness. After writing a long and intelligent account of the manifestations of the disease, he considers it necessary to apologise for mentioning the ordinary resources of the Faculty in the same page with the sovereign cure, saying that he is only induced to speak of the former at all because "the infidelity of many in this fantastical age and the want of opportunity of others, doth deprive them of this easy and short remedy," and he proceeds to lament "the weakness of medical ability when compared with that of His Majesty, who cureth more in one year than all the Chirurgians of London have done in an age." A still more curious belief was prevalent at the same time—that a wound could be cured by medicinal anointment of the weapon with which it was inflicted. Purmann, of Breslau, the author of some big surgical tomes, records his experience and observations as proofs conclusive that this measure was superior in its results to the customary treatment, and there is good reason to believe that, to this extent, he was perfectly right.

There was still but little that merited the name of surgical pathology, and the almost universal acceptance of the fancies of the humoralists barred the way to a better knowledge. For example, a cancer is termed by Wiseman "an adustion of humours which, upon an over-concoction, or rather broiling, grow retorrid and sharp." Again, although the itch insect had been detected by Avenzoar in the twelfth century, scabies was described by Wiseman as due to "a vicious ferment in the skin which makes a concoction and leads to a conversion of the nutritious juices thither conveyed, into the disease," and was accordingly to be treated by purgatives and blood-letting; and even in a condition so familiar to the surgeon as hernia no distinction was made between the femoral and inguinal forms. In most other surgical diseases it was the

applied near the brain on the seventh day, setting free a quantity of black grumous blood, which blood, explains Ryder, "by pressing upon the meninges and sending forth putrid steams, had been the occasion of the ill symptoms," and the symptoms at once disappeared.

same ; there was either complete ignorance, the complaint not being segregated from others which bore a superficial resemblance to it, or its real nature was obscured by verbose attempts at definition which conveyed no precise meaning either to the teacher or the pupil.

The position of the surgeon in England, France, and Germany underwent little change, but he no longer submitted as meekly as before to the scornful domination of the physician. In London the barber-surgeons were constantly subjected to fine for administering internal remedies upon their own responsibility and contrary to the provisions of their charter ; and in 1632 the physicians trespassed so far upon the autonomy of the surgeons as to obtain an Order of Council prohibiting them from performing any major operation, except in the presence of a physician. The Company, however, procured the repeal of this law three years afterwards, and although they were unable to overturn the rule with regard to medicine, they were ready to fight against its enforcement. In the barber-surgeons' records for 1590 there is a significant entry, "Whereas there hath been an abuse offered to Mr. ffenton Bynns by Dr. Goodall for giving internal medicines in a case of surgery, ordered that, if the College of Phisitians doe arrest Mr. Bynns, that he shall be defended at the cost of the Company."

Medical education remained in an unsatisfactory state, except in Italy, where a system of clinical instruction in hospitals had been inaugurated. In England the training of the average surgeon was lamentably deficient, and the tests of fitness for practice were necessarily of anything but a searching kind. It is to be feared too that the examinations of the Barber-Surgeons' Company were not always conducted in such a way as to avoid the appearance of evil, for in 1611 "James Blackborne applied to be admitted a brother of the Company and to practise surgery, and promising to pay £10 for his admission, and to make the examiners a dinner." He passed. Nearly a century later, in 1709, it was found necessary to order that no examiner in surgery should in future accept any gratuity from, or be treated or entertained in any manner by, any sea surgeon or surgeon's mate, either before or after examination, on pain of being removed

from his offices as an examiner and assistant of the Company." The picture given by Smollett, in 'Roderick Random,' of his examination at the Surgeons' Hall, in the early part of the eighteenth century, is a melancholy appendix to the damning confessions in the records of the guild.

Bad as was the condition of surgery in England, it was little, if any, better in France and Holland ; and in Germany, Russia, and Scandinavia the genuine barber-surgeon of the fifteenth century still plied his double trade. Under such circumstances it is scarcely a matter of surprise that the not very numerous body of half-educated surgeons should be supplemented, and often supplanted, by an army of quacks of both sexes. In some countries the evil was almost ludicrous, but we reach the bathos of surgical practice in Breslau, where, as we learn from the 'Chirurgia Curiosa' of Purmann, the popular authority amongst rich and poor for the treatment of spinal deformities was the wife of the hangman.

With the *eighteenth century* there began a vigorous upward struggle in which almost every country in Europe took honourable share. It was an era made illustrious by anatomists like Albinus, physiologists like Haller, pathologists like Morgagni, surgical observers like Méry, Petit, and Pott, operators like Cheselden, Chopart and Desault, and writers with the gift of critical compilation like Heister, Richter, and Benjamin Bell ; but the one intellect which dominated all others was that of John Hunter. Hunter was not only the greatest surgeon of his century, but he was great amongst a company of giants. And yet his greatness did not lie in the same direction as that of the men who preceded and were associated with him. He was not an inventor of surgical procedures—the only operation linked with his name had been performed by a Greek surgeon more than a thousand years before his time—but of surgical principles. His ~~was~~ ^{was} the genius of infinitely multiplied observation and experiment, the capacity for evolving from the great mass of results laws and generalisations for the guidance of succeeding generations, and the determination to know the truth so far as human ability and patience could attain it ; that disposition, as he himself expressed it, "to distrust opinions and to examine every subject for himself," which is the

very essence of scientific research. Anatomist, in the widest sense of the term, zoologist, botanist, physiologist, and surgeon, he brought the whole range of his knowledge to bear upon the broadest questions of surgical disease. To quote from one of the most eloquent and philosophical of the noble tributes to his memory that are rendered by our leaders yearly at the college of Surgeons,¹ "He was, and is, beyond and above all surgeons, a philosopher in surgery. His idea of the subject of his thoughts was far more adequate than that of other men. He was supreme in the scope and method of his work. He understood much better than those around him how to engage in the interpretation of Nature; he knew best how to approach and to disclose truth. For he not only understood that the problems which lay immediately before him were of all the most complex and difficult to solve, but he could see also that they were not isolated or dependent ones. He saw in the necessary relation in which they stood to others the only means by which they could be worked out, and on this understanding he resolved to investigate the questions he desired to answer." There is no time to dwell in detail upon the contributions which he made to surgical science, but all who would understand the vast scope and penetrating quality of his mind should digest the 'Treatise upon the blood, inflammation, and gunshot wounds,' and visit the great offspring of his brain and energy, the Museum of the College of Surgeons, where they may study the man in the concrete results of his work. The enormous fund of material brought together by his colossal industry and now collected in a worthy storehouse was enough to make him famous had he never penned a line, but his writings show us that all this was but the means to a greater end.

To give a list of the great surgeons of the eighteenth century and of their achievements would lead us too far, and I must confine myself to a very brief summary. First and above all we owe to John Hunter the foundation of experimental and philosophical pathology. The range of operative surgery has widened in all directions owing to the enterprise and ingenuity of surgeons like Cheselden, Sharp,

¹ Hunterian Oration, by Mr. Savory, 1887.

Chopart, and Desault, who guided by anatomical knowledge attained a confidence, swiftness, and dexterity that would have appeared little less than marvellous to the men of the previous age. In their hands amputations were extended for the first time to the largest joints, new and ingenious methods of incision were devised, and the operation once the terror of the surgeon became his pride, while conservative surgery in the form of the old Greek operations of resection of diseased joints and removal of buried portions of dead bone was revived to limit the sacrifice of limbs that might yet be made useful. What this means will be understood by those who have read the account of tubercular disease in Wiseman's works and have learned how the sufferers even under the best attendance that the age could furnish were tortured needlessly by the surgeon and drugged uselessly by the physician till they died. It was the surgeons of the eighteenth century who finally banished to the limbo of well-meant abominations the red-hot irons and vitriol pellets of their predecessors; and in their time too were laid the foundations of a bolder practice in the future by many isolated operations, experiments upon the lower animals, or well-considered suggestions which were to be remembered and utilised in more modern days.¹ There

¹ Amongst the many things may be named the first operation for suture of cleft palate by Le Monnier; nerve sections for neuralgia by Mareschal (c. 1710), (revived by Haighton in 1798); puncture of the bladder through the rectum by Pouteau (1760), and above the pubes by Méry (1701); œsophagotomy for the removal of a foreign body by Goursault (1738), inguinal colotomy, proposed by Littre (1720), and carried out by Duret (1793); lumbar colotomy proposed by Callisen, but not performed until the present century; ovariectomy attempted by Houston (1701); intubation of larynx practised by Desault; sequestromy revived by Davis; resection of intestine by Ramdohr; the invention of the tourniquet in its perfected form by Petit; digital compression of the main artery for commanding the circulation in a limb by Desault; the treatment of aneurysm by proximal and distal ligature by Anel, Brasdor, Desault and Hunter; the ligature of the larger arteries, such as the external iliac (1796) and carotid (1798), by Abernethy, and the axillary by Desault; tenotomy of the tendo-Achillis for club-foot by Lorenz (1784); excision of the lower end of the rectum by Paget (1739); the closure of vesico-vaginal fistula by Voelter (1722); extraction of the cataractous lens by Petit at the suggestion of Méry; the perfection of lateral lithotomy under Rau, Méry, Cheselden, and others; perineal lithotomy by the "lithotome caché" of Frère Côme; the revival of supra-pubic lithotomy by

were science, courage, and consummate skill; and only two things were wanting to bring the surgery of the end of the eighteenth century near to perfection, but for these we were forced to wait through two generations.

Surgical literature was enriched in the eighteenth century by many classical works amongst which those of Hunter, Petit, Pott, and Haller take the first place as original contributions, while those of Dionis, Sharp, Heister, Callisen, Camper, Richter, and Benjamin Bell and others ministered importantly to the diffusion and progress of surgical knowledge.

Surgical education, which, except in Italy, could scarcely be said to exist in any systematic form during the seventeenth century, underwent a rapid development. In France the fusion of the surgeons of St. Côme and the former barber-surgeons into the Académie de Chirurgie by Mareschal in 1731, with Petit as its director, and the subsequent foundation of the 'École pratique de Chirurgie' by Chopart and Desault, raised the art to a position of dignity it had never before occupied in England. The hospitals of St. Bartholomew, St. Thomas, and St. George established medical schools to the great advantage of British surgeons but to the great dissatisfaction of the Barber-Surgeons' Company. The surgeons shook off their nominal association with the barbers in 1745 (the Dublin surgeons following in 1784) and secured a charter for a new company which opened with Ranby as master and Cheselden and Sandford as wardens, and in 1753 enlisted Pott and Hunter as the first masters of anatomy, finally assuming in 1797 the title of Royal College of Surgeons. In Edinburgh the Company of Surgeons, and afterwards the University, obtained the services of Alexander Monro (the first of the name) as Professor of Anatomy. In Berlin a Medico-Chirurgical College was established in 1714 to which in 1726 was joined a School of John and James Douglas (1710) and Cheselden; rectal lithotomy proposed by Hoffmann (1779), and performed on the dead subject by Martin (1786); excision of knee by Filkin (1762), of shoulder by White (1769), and previously by Vigaroux and David; amputation at hip-joint by La Croix (1748), and at shoulder by Morand the elder. The immense advances in the scientific comprehension of syphilis, diseases of the spine, hernia, and many other surgical ailments would require a volume to relate.

Clinical Surgery. In Vienna a school was founded for training army surgeons. Lastly, in America, the first systematic teaching of surgery was instituted at Philadelphia towards the close of the century.

Although so much was effected, still more remained to be done. The work of teaching indeed had only commenced; for although those who loved knowledge might find a way to acquire it, there was no pressure to force those who loved it not to fit themselves for the exercise of their profession, and there were few of the facilities that now tempt the indifferent to acquire the affection which a better acquaintance with the subject might arouse. For the clinical and practical study of surgery money was as essential as capacity and industry; dissection and experimental operations were luxuries for the few, and even the fortunate ones were usually compelled to purchase these opportunities by a secret and degrading traffic; and the obstacles in the way of acquiring a due knowledge of anatomy and pathology were for the many quite insurmountable. Mr. Henry Power has given us a graphic picture of the results of the strong repugnance cherished by the non-professional classes for the examination of the human body after death, during and before the time of Hunter¹, and this repugnance had to be combated at a later time by the memorable speech of Lord Macaulay, which won its success, not as a plea for the advancement of science, but as an appeal to the selfish instincts of the people.

At length we reach the *nineteenth century*, but I cannot hope to convey an adequate idea of the marvellous progress which has taken place in these ninety years that separate us from the period just reviewed. We were told by Sir William Mac Cormac in his recent thought-stirring oration upon Abdominal Section at the Medical Society, that, seventy years ago, Baron Boyer, a noted French surgeon, announced that surgery had then "completely or almost completely reached perfection," but in the light of our present knowledge, how do we regard the surgery of 1820? With feelings very similar perhaps to those with which our posterity in 1960 will look back upon the surgery of 1889. For the surgeons, however, we have nothing but admiration. There were

¹ Hunterian Oration, 1889.

giants in those days, more in number than I can venture to name ; but much of their strength was unavailing, because of a great need to be supplied and a grave defect to be perceived and amended. The need was a means of annulling pain during surgical operations ; the fault was an imperfect conception of the virtue of cleanliness.

Even as early as the Middle Ages there had been attempts to compass the insensibility of the patient while under the hands of the surgeon. Henbane and other narcotics administered by draught or inhalation were used by the surgeons of the school of Bologna in the thirteenth century. Intoxicating drinks were tried from time to time with the same object. Bleeding to syncope was a proposition of this century, and mesmerism, that " recent foolery," as South termed it in 1847, found energetic advocates, but none of these expedients held their ground. Operations were performed while the patient was in a state of full or exaggerated consciousness, and the surgeon indeed required what Celsus thought essential for his calling, a mind intrepid, and not to be moved by the cries of the sufferer.

It was not until 1841 that ether, which is said to have been known from the thirteenth century, was first employed as a surgical anæsthetic by Jackson, of Boston. Chloroform, discovered by Soubeiran in 1821, was first used a few years afterwards in experiments upon the lower animals by Charles Bell and Flourens, but its introduction to surgeons dates from its employment by Simpson in 1847. The gift, however, was not received with universal acclamation, and for many years after it had been accepted by the general body of the profession there were distinguished operators who considered the insensibility of the patient dearly bought at the expense of certain dangers and inconveniences which the drugs were found to entail, but at this moment no argument is necessary to prove to the surgeon how immense is the boon conferred upon his art by the power that anæsthetics have given him. Humanity in its more immediate and obvious bearings was the motive that prompted their first adoption, but something lay beyond the simple suppression of suffering, and we now see that many of the greatest achievements of modern surgery would have been scarcely possible,

or at any rate would be so far restricted in their application as to lose nearly the whole of their immense value to mankind, were it not for chloroform and ether. Anæsthetics, moreover, are inducing an alteration in the type of the surgeon. Before their introduction, the two chief requisites for distinction in the practical section of surgery were the power of controlling the natural instincts of sympathy amidst the shrieks and struggles of the patient, and the peculiar dexterity which combined extraordinary swiftness with precision of manipulation ; but these qualities are no longer indispensable, and others of a higher kind have arisen in their place. The brilliant operation of the past, measured by the watch, like a foot race, to test the record, doubtless had some immediate advantages in its day, but it was often far more impressive for the spectator than profitable for the ultimate welfare of the patient, and we are well rid of it.

The conquest over pain by the suppression of consciousness was a great feat, and the agents which effect this can never be entirely superseded ; but the next desideratum was a local anæsthesia that left the mind intact. This had been sought in the last century by the nerve-compressing machine of Moore (1784) and partially realised by the freezing apparatus of Richardson in 1860, but the discovery of the properties of cocaine by Koller five years ago have established a new starting point, and it is probable that before long the principle may be so far developed that the ground held by ether and its allies will be reduced within comparatively narrow limits.

The great defect of surgery, however, was an imperfect conception of the nature of and necessity for cleanliness. I do not imply that surgeons in those days were unclean in the coarse sense of the word. A few of them, and great men too, actually were so, but the majority observed the common rules of purity with the natural instinct of the educated mind. But this was not enough. The surgeon who would carefully wash his hands and felt a pride in the brightness of his instruments would too often assume in the time of action a garment saturated with the decomposing filth of a thousand operations ; and even those who shunned the "operating coat" did not dream of the menagerie of infective organisms that

might lurk in unexplored recesses of the finger-nail, or in the catacombs of the abstersive sponge, or circulate in the atmosphere of the ill-ventilated ward. Some here present have witnessed the terrible penalties attached to our ignorance, and know that the great hospitals designed for the cure of disease were often the worst centres for its dissemination, and that in certain of these charitable institutions the most lethal forms of blood poisoning would follow like a nemesis in the track of the surgeon's knife. It was only last year that Dr. Cullingworth expressed with characteristic force of language the same story of the vengeance of outraged purity in the gynæcological practice of former days; and we know there was a time when the fear of operation-disease practically closed many parts of the body against the knife of the surgeon, when a patient with a ruptured bladder or internal strangulation could only hope for the euthanasia of narcotism, or a woman with a tumour of the uterus or ovary must bear her infliction till death released her. To open the abdomen then was regarded as foolhardy temerity, and so perhaps it was, and would be now, had we not learned the source of our danger and the way to escape it. It is hardly necessary to utter the name of the surgeon who first taught us the lesson, and established a new era in the history of surgery; for it has become incorporated with a word that is synonymous with antiseptics. There are distinguished members of our profession who still deride what they call "antiseptic surgery," but they have not aimed at the right mark. The essence of antiseptic surgery is not the employment of chemical antiseptics, although these are convenient adjuncts; it is the exclusion of septic germs; and it may be said without hesitation that no surgeon has ever been successful who has not consciously or unconsciously taken the necessary precautions to achieve this end; and that those who attained great results in earlier days did so because they had worked out the essential truth for themselves and had carried it into practice.

The practical surgery of the present century may be divided into two parts, the first belonging to the term of more than sixty years anterior to the introduction of antiseptic principles, the second extending from this to the present day,

and owing its characters to the combined influences of anti-sepsis and anæsthetics.

The surgery of the pre-Listerian period may be classed with that of the eighteenth century. Its leaders were men of the same strain as Cheselden, Desault, and Chopart,—sound anatomists, ready of resource and invention, cautiously daring in endeavour, and wonderfully expert in manipulation—so far as operative surgery went, in the technical sense, they had almost if not quite reached finality. To speak only of those who have passed away, the names of Astley Cooper, Liston, Syme, Fergusson, Dieffenbach, Malgaigne, and many others of note will be suggested under this heading. With these were associated accomplished experimental physiologists, like Charles Bell; great organisers of military surgery, like Larrey; men gifted with the genius of compilation and annotation, like John Flint South; and advanced philosophers, like Joseph Henry Green. But it is dangerous to enter upon exemplification, for every name suggests so many others with equal, or almost equal, right to stand in a list of the great representatives of surgery that he who attempts it is unlikely to satisfy himself or others. In this time the work of the eighteenth century was carried on without material divergence from the lines laid down by Pott, Desault, and their contemporaries. In surgical pathology new and great observers arose to carry on the work begun by Hunter; diseases hitherto unrecognised were carefully described and classified; in operative achievements there was no limit to enterprise, except in connection with the three great cavities of the body, which were still almost closed against the surgeon; and all the departments of science lent aid in providing new instruments for research, for diagnosis, and for remedial use. Beyond this the foundation of noble museums, like those of Hunter and Dupuytren; the great development of teaching in the medical universities and colleges of Europe; the removal of the restrictions imposed upon direct anatomical investigation by popular prejudice; the formation of societies and associations for the interchange of ideas and for the organisation of research; and above all, perhaps, the rise of a scientific and scholarly medical press, conferred a power that was nobly employed

by its first owners, and will profit succeeding generations in constantly multiplying ratio. All these constituted integral parts of a grand scheme of education, and although the system is still incomplete, we have only to look back a few decades to realise the prodigious strides that have been made towards the realisation of the surgical ideal.

The work achieved by the present generation in the anti-septic period has already formed the subject of more than one address, and now, in the few minutes that remain, can only be adverted to in the briefest manner. We have an enormous improvement in the safety of almost every operation that involves an open wound of any kind, and nearly all the natural or morbid processes attended with a breach of surface have shared in the benefit; a great numerical increase in all operations, owing chiefly to the removal of the patients' apprehensions of suffering; an ever growing prevalence of conservative over what may be called destructive surgery; and the invention of new operative procedures, many of which have involved the opening up, to the saving hand of the surgeon, of regions hitherto almost untouched. Thus we have an abdominal surgery, including free exploration of the cavity whenever the symptoms of disease or injury warrant the step, the abscission of tumours, the extirpation of diseased viscera, the removal of abnormal concretions interfering with the functions of important organs, and many other undertakings once thought beyond our reach. We have a new thoracic surgery, and we have a new surgery of the brain and spinal cord. To these might be appended a vast number of additions and improvements in our resources, which are not susceptible of easy classification, and must be passed over unenumerated.

Such a review, incomplete though it is, might at first sight incline us towards the self-congratulatory frame of mind attained by Boyer seventy years ago, but his example should warn us to profit by the pithy counsel of a latter-day sage—never to prophesy unless we know. Seriously, however, it should be obvious that there are no limits to progress in our art; that every advance in Anatomy, Physiology, and Pathology may draw the labours of the surgeon into new channels, and that new discoveries in general science may

with every year provide better means for the diagnosis and treatment of surgical disease. In manual skill it is indeed probable that we have little more to gain, but we may be certain that the hand will always find sufficient cunning to follow the behests of the mind.

What are the lessons that we learn from the history of Surgery and from our knowledge of the men who have made and are still making it? The motive powers that directed Paré, Hunter, and Lister, as they directed Vesale, Harvey, and Darwin, have been, firstly, *Industry*—that kind of purposeful industry which produced the thirteen thousand preparations of John Hunter; secondly, *Observation*—the observation which penetrates to the inner meaning of the fact noted, and knows how to profit by error and mischance as well as by successful experiment. Thirdly, *Scepticism*—not the shallow disbelief in all that lies beyond our reason and experience, but the scientific scepticism that always bears in view the possibility of error in all opinions, our own, and especially our own, as well as those of others, and prompts the application of observation and experiment to confirm or correct them so far as lies within the scope of our powers and opportunities. Lastly, *Honesty*—the honesty that should lead every one of us to give his best work to science and mankind, to confess his failures when the lesson may be profitable to others, and to despise the struggle for unmerited reward.

An introductory address is often held to be incomplete without some words of advice to those of the audience who are just about to enter upon their career, but I must confess to a very slender confidence in the efficiency of moral aphorisms, and I will in conclusion only ask you to treasure the words of a poet of our own day—

“ In God’s clear sight, high work we do,
If we but do our best.”

