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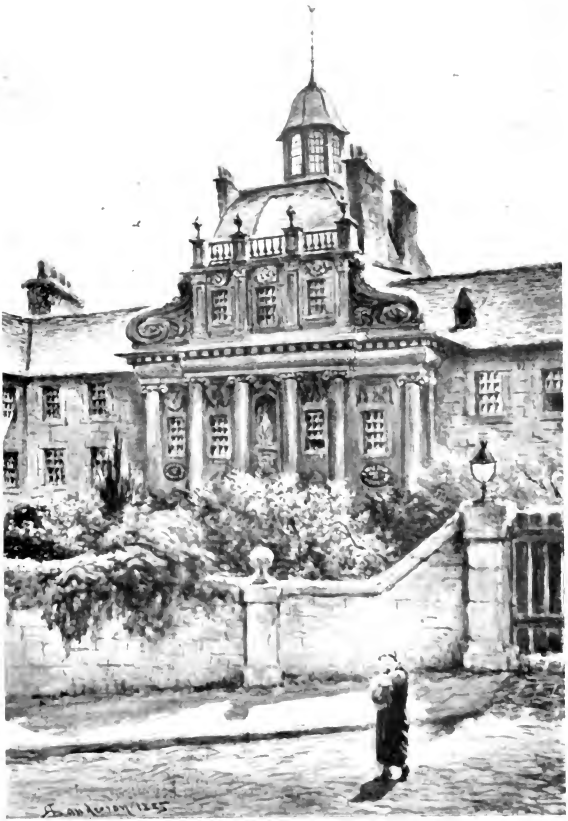
THE EDINBURGH SCHOOL OF SURGERY BEFORE LISTER



THE OLD ROYAL INFIRMARY

(From a painting by Sanderson, in the possession of the Managers of the Royal Infirmary of Edinburgh.)

THE EDINBURGH SCHOOL OF SURGERY BEFORE LISTER

BY

ALEXANDER MILES

SURGEON TO THE ROYAL INFIRMARY, EDINBURGH

WITH EIGHT PAGE ILLUSTRATIONS

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PREFACE

THE student of surgery who confines his reading to modern textbooks, which of necessity deal only with matters of present-day interest, fails to see the outlines of his subject in their true historical perspective. The existing state of surgery as a science and an art is duly presented to him, but the steps by which it has reached this state he has no means of tracing. The names of the old masters he may meet, but they remain to him but names attached to particular operations or instruments, and he gathers little of the part they played in the evolution of our knowledge and less of what manner of men they were. Seeing only the perfected results of the surgery of to-day, he fails, on the one hand, to realize the difficulties that had to be overcome by the pioneers of surgery, and, on the other, to grasp the real significance of the revolution effected by the master mind of Joseph Lister.

The purpose of this brief sketch is to enlist the interest of the student in the history of his subject by tracing the rise and development of a school of surgery from the days when the practice of the

surgical art was in the hands of the craft of barber-surgeons, who carried it on largely as a trade, down to the beginning of the Listerian era, when it had attained to the dignity of a learned and scientific profession.

The limits I have set myself by selecting, for obvious reasons. the Edinburgh School, restrict the scope of the historical study and exclude from these pages many names famous in the annals of surgery, but in other numbers of this series of "Historical Manuals" the gaps I have left will doubtless be filled up.

In the biographical sections, for the convenience of the reader, I have inserted in italic figures the age of the subject at important periods of his career, believing that this is of greater interest than the mere date. The superior figures refer to the items in the bibliography at the end.

For facilities in providing the illustrations I desire here to express my indebtedness to the Managers of the Royal Infirmary, the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, the Professor of Surgery in the University, and Miss Bell, Edinburgh.

ALEXANDER MILES.

EDINBURGH,
October, 1917.

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CHAPTER I

THE PERIOD OF THE BARBER-SURGEONS

The Barber-Surgeons—The Seal of Cause—The Craft of Chirurgeons—The Separation of the Surgeons and Barbers.

THE Edinburgh School of Surgery may be traced back to the year 1505, when the "surregeanis and barbouris," who had just been erected into a Corporation, presented to the Town Council a petition which included the request "that we may have anis in the yeir ane condampnit man after he be deid, to make anatomea of, quairthrow we may heif experience, ilk ane to instruct utheris, and we sall do suffrage for the soule."[1]

It may be that the granting of such a petition, even with its explicit obligation that each one should instruct others, is not sufficient to mark the foundation of a School, but it expresses the willingness of the governing authorities to satisfy

the aspirations of those who desire to cultivate and impart knowledge, which is the first step towards it.

It is to be borne in mind that this petition was made and granted eight years before the Battle of Flodden, when Scotland was in a state of political anarchy, her people poor, ignorant, and cruelly oppressed by the despotic barons, and when learning was held in small esteem. The fathers of anatomy, Vesalius and Fallopius, were still unborn, and it was not till many years later that the Emperor Charles V. convened the divines at Salamanca "to determine if it were consistent with conscience to dissect a human body for the purposes of science." Thirty-five years had still to elapse before the English Company of Barber-Surgeons was chartered, and even the oldest of the English Medical Corporations, the Royal College of Physicians of London, was not founded till thirteen years later.

Thus early do we find the surgeon-barbers of Edinburgh arrive at the great truth, which has governed the teaching of surgery in the school ever since, that the foundation of sound surgical practice rests upon a knowledge of anatomy, and in their petition they represent "that everie man that is to be maid frieman and maister amangis us be examit and previt in thir poyntes following—thatt is to say :

That he knaw anatomea nature and complexioun of every member In manis bodie. And in lyke wayes he knaw all the vaynis of the samyn thatt he may mak flewbothomea in dew tyme. And als thatt he knaw in quilk member the signe hes domination for the tyme for every man aucht to knaw the nature and substance of every thing thatt he wirkis, or ellis he is negligent. . . ." Incidentally, the petition contains the germs of the Preliminary Examination, for it was stipulated that no master of the craft should take an apprentice "without he can baith wryte and reid."[2]

It must not be omitted that under their "Seal of Cause" the Incorporation were granted privileges other than the right to dissect a condemned criminal once a year, for it was further ordained: "That na person man nor woman within this burgh mak nor sell ony aquavitæ within the same Except the saidis maisteris brether and frieman of the saidis craftes under the paine of escheit of the samyn but favouris."

It would be ungracious to canvass the question as to which of these privileges was most highly valued by the masters, brethren, and freemen of the craft, but it is a matter of history that while their prescriptive right to make and sell whisky has long been lost, they have never relinquished any legitimate claim to anatomical material. They were

even at one time accused of favouring methods which were not strictly legitimate, but "the scandalous report, most maliciously spread about the town, that some of their members were accessary" to the violation of the sepulchres in the Greyfriars Churchyard was vehemently denied in a Memorial Act sent to the Magistrates in Council, and it was enacted that any member found guilty of such "unnatural and unchristian practises" should be expelled their Society, and that any apprentice or servant similarly convicted should be "expelled his master's service with disgrace."

One effect of the granting of the Seal of Cause was to throw upon the Incorporation the onus of providing the citizens with a sufficient number of barbers licensed "to clip, cow, and shave," but as the simple barbers were restricted to fulfilling these humble offices, and were not permitted "to use any point of chirurgie, under pain of tinsell of their fredome," each section of the craft performed its proper functions, and the cosmetic needs of the community were satisfactorily met. In course of time, however, the conditions of admission of the simple barber were so modified that his entering the Incorporation was "without prejudice to him to crave admission to the art of chirurgie when it shall please God that he be able to discharge his duties therein." It must be assumed that the test of the

applicant's ability to perform the duties of a surgeon was less exacting than this condition seems to suggest, for the "tryall" for promotion to the status of surgeon-barber was conducted by the Craft itself, and was so lenient that most of the fresh entrants passed it. Thus it came about that the simple barbers, who in the earlier years of the Corporation were in a majority, were soon out-numbered by the surgeon-barbers, and the "Barber-Craft" gradually gave place to the "Craft of Chirurgeons," which, in 1583, was granted pre-eminence amongst the Trade Guilds of Edinburgh, the first Deacon being Gilbert Prymross, an ancestor of the Earl of Rosebery. A brass mortar and pestle bearing the name of Gilbert Prymross is in the possession of the present Earl, and the connection between the family of Primrose and the Edinburgh College of Surgeons is still maintained, as the present Lord Rosebery is one of its Honorary Fellows.

The oldest minute-book of the College dates from about this time (1581), and contains on its first page a prayer, ascribed by well-founded tradition to John Knox, with which every meeting of the College is opened to this day. It is as follows:

> "*O eternal God, and our loving and mercifull Father in Christ Jesus, seeing we are*

conveenit heir to treat uponn these things that concernis our calling, we beseik thee, O Lord, to be mercifull to us, and giff us grace to proceid thereintill without malice, grudge, or partialitie; sua that the things we may do may tend to the glorie of God, the weill of our vocation, and confort of every member of the samen; throw Jesus Christ, our only Lord and Saviour; Amen."

In 1648 a further step was taken to strengthen the surgical side of the Incorporation, for it was then decided that "no barber should be admitted in time coming except he be tryed and found qualified in Chirurgie." This action brought the surgeons into active conflict on the one hand with the barbers, who were thus deprived of their right to practise their calling except on the suffrance of the surgeons, and on the other with the Town Council, who, in order that "the lieges may not have sufficient ground to clamour" on account of there being "a great scarcity of good qualified persons within the city who have skill to trim and barberize," called upon the Incorporation of Surgeons "to take some effectual course, that the City might be furnished with a competent number of persons skilled in cutting of hair and taking off beards." A number of barbers were duly licensed,

and the clamour of the lieges ceased, but the barbers were far from satisfied with their subordinate position.

After many family quarrels, and finally a prolonged litigation in the Courts, the two bodies were separated by a decree of the Lords of Session in 1722.[3] Neither party desired this decision or was satisfied with it, but it had the advantage for the surgeons that it freed them of a certain incubus and enabled them to develop their own art on professional lines untrammelled by the more purely trade outlook of the barbers.

The Society of Barbers lingered on till 1892, when its last meeting was held. "At that meeting the whole Society—a father and son—were present. They elected each other Preses and Box-master respectively, reappointed their clerk, and departed to meet no more. The Preses died, the Box-master left the country, and has not been heard of for years, and the clerk alone is left, with the old oak treasure box, the minute-books, and papers in his keeping."[4]

It cannot be claimed that in the period during which the barber-surgeons dominated the medical profession in Edinburgh the standard of surgery was a high one, or that any striking advances were made in surgical science. The records of the craft that have come down to us deal largely with

domestic affairs, and it is only incidentally that the surgical activities of the members are mentioned. There is evidence that Gilbert Prymross, Chirurgeon to King James VI. and the first Deacon of the Incorporation, enjoyed a considerable reputation beyond the boundaries of the "gude toune" in which he lived, for Doctor Peter Lowe, the founder of the Faculty of Physicians and Surgeons of Glasgow, dedicated to him his *Treatise on Chirurgerie*, an honour which he shared with James Harvie, another member of the craft and surgeon to the Royal Family.

An entry in the accounts of the Lord High Treasurer refers to the payment of the sum of fourteen shillings to an early member of the barber-craft for "taking furth the Kingis tuth," which shows that the barbers did not confine themselves to trimming, shaving, and phlebotomizing. Indeed, the King's barber not only supplied His Majesty with "holland claith at ten shillings the elm, but supplemented his income by selling crossbowes and daggers."

To what extent the following record, dated 1542, refers to surgical services can only be surmised: "Item: gevin to Anthone Brisset, surrurgeane, for labouris done by him to the Queenis Grace* at

* Mary of Guise, second Queen of James V.

this time allenarly . . . *xx* li." There is no doubt about the next item, which refers to the payments made to four members of the Craft engaged on military service against "our auld inemyes of England" during some border raid: "Item: gevin to George Lecke, William Quhite, George Fotheringhain, and David Robertsoun, Surrurgeanis passand to the bordouris, for curing of all personis that hapnit to be hurt by the Inglis menne. *xii.* li."

It is on record that in 1572, "James, erle of Mourtoun, regent, lay diedlie seik of rumbussanes [rupture], and war nocht he was cuttit he had lost his lyff." The operator who thus prolonged the life of the Regent, till "the maiden" claimed his head nine years later, is believed to have been John Chisholm, Doctor of Medicine, a member of the Incorporaton, and Chirurgeon to King James VI.

As late as 1627 the barber-surgeons shared in the public appointments in the City, for we find that provision was made by the Governors of George Heriot's Hospital to appoint "one Chyrugian-Barber who shal Cut and Poll the Hair of all the schollars in the Hospital; as also look to the Cure of those within the Hospital who any way shal stand in need of his Art."[5, 6, 7]

If the barber-surgeons contributed little to advance surgery as an art, they rendered an abiding

service to the progress of the Edinburgh school by the part they took in cultivating the study of anatomy and preparing the way for the development of the great anatomical school out of which the Faculty of Medicine in the University subsequently arose.

CHAPTER II

THE EARLY ANATOMICAL SCHOOL

The Anatomical School—James Borthwick—Examination in Anatomy—Alexander Menteith—The Beginnings of the Surgeons' Museum—The Surgeons' Anatomical Theatre—The First Public Dissection—Robert Eliot—The First Professor of Anatomy in the Town's College—Adam Drummond—John McGill.

If the history of the barber-surgeons can be said to mark the first phase in the genesis of the surgical school in Edinburgh, the gradual development of the school of anatomy may be taken as the next step in its evolution.

It will not be forgotten that from its earliest days the Incorporation had been inspired with the idea "that every man ought to know the nature and substance of everything that he works, or else he be negligent." This fundamental principle of all good workmanship seems to have dominated the mind of the surgeon-craft, and for two hundred years its records show that it made persistent efforts to obtain an increased supply of the material necessary for acquiring a sound knowledge of surgery based upon the study of anatomy

by dissection. It is true that for more than a century the annals are singularly silent regarding the use made of the "ane condampnit man" granted by the Town Council in 1505, but it would not be fair to assume from this that the members of the calling had fallen away from grace and allowed their enthusiasm for the study of anatomy to lapse. The social and political conditions in Scotland throughout the sixteenth and the first half of the seventeenth centuries were not favourable to scientific research or even to the pursuit of utilitarian study. For the majority of the people life was one long struggle to obtain a bare subsistence; comfort was for the favoured few, and luxury, as we now know it, could not be said to exist. The members of the Incorporation belonged to the middle classes; as individuals their first necessity was to obtain a decent livelihood, and as members of a trade-guild they were more immediately concerned to protect the corporate rights and property of their craft than to extend their capacities for usefulness. In view of the meagre and precarious opportunities they had for dissection the wonder is that they retained the interest that they did.

As early at least as 1647 the study of practical anatomy was part of the training of the apprentices of members of the craft, for it is recorded in the

THE TOMBSTONE OF JAMES BORTHWICK IN GREYFRIARS CHURCHYARD, EDINBURGH

(From a photograph in the Collection of the Royal College of Surgeons of Edinburgh.)

Minutes of the Incorporation of Cheirurgeons that on his admission JAMES BORTHWICK took the oath to conform to the Seal of Cause, "especially to the point of dissecting of anatomy for the further instruction of apprentices and servants."

This James Borthwick was one of the most active of the early surgeons of whom we have any record; he played a prominent part not only in the affairs of the Incorporation, but in the wider field of national politics. While he was Deacon, in 1661, he was selected by the Town Council as one of the two representatives of the city in the Scottish Parliament. His portrait—the oldest in the possession of the College—hangs in the hall, and represents him as a somewhat heavy-featured man, dressed in the style of Rembrandt's *Syndics*. He was buried in Greyfriars Churchyard, and his tombstone on the gable of the old church confirms Stevenson's fancy that "we Scotch stand highest among nations in the matter of grimly illustrating death." A dancing skeleton, holding at arm's length an open folio, is sculptured in the centre astride the scythe of death; the plinth bears the familiar skull and crossbones, representations of coffins, spades, and picks; and the side panels are festooned round with various surgical instruments.

About this time rules were laid down for the

trial of intrants to the Incorporation, which seem to show that the early obligation of the members that each one should instruct others in anatomy had not been unfulfilled. Thus, it was ordained that "on the first day of the examination the candidate shall begin with the introduction to surgery . . . and make a general discourse on the whole of anatomy without any demonstrations." On the second day "he is to demonstrate by ocular inspection more particular on some parts of anatomy which shall be appointed to him by the Deacon and Masters . . . and show some operation in the foresaid subjects." That this examination was no mere formality is evident, for it is further specified that "if the Deacon and Masters find him qualified or unqualified they may admit or reject him, or otherwise continue his examination in the first subject," and it is grimly added, "aye, and until they find him qualifit."

The first serious attempt to establish a regular course of instruction in anatomy was made in 1694, when ALEXANDER MENTEITH approached the Town Council with a view to obtaining a more adequate and regular supply of anatomical material than had hitherto been available. His request was favourably received, and he was allowed to have "those bodies that dye in the correction-house," and "the bodies of fundlings that dye upon the

breast, . . . for encouragement of so necessary a work as the improving of anatomy." He was also granted "a convenient house for dissection and the use of the College Kirk Yard for the burial."

In his petition Menteith had promised that "he would not only lay himself out for the improving of anatomy, but also would serve as chirurgeon to the town's poor gratis, but to be paid for his drogs at prime cost." This duty he was well qualified to undertake, as he was acknowledged to be the leading surgeon of his day, and was twice elected President of the Incorporation of Surgeons.

It would appear that the museum of the College, which is now one of the finest collections in the kingdom, had already been started, for we find that Menteith "added to the rarities in the College, ane egyle," which found itself in the company of "three scorpions and a chameleon," presented by Lord Royston, and "an allegatory or young crocodile," the gift of Dr. Charles Oliphant. The minutes of the College show that the members of that day were interested in natural history, for it is recorded that the treasurer was ordered "to pay the man a crown for showing them two live tortoises"; and they entered into a lawsuit with the magistrates of Dundee over the carcass of "ane elephant." A later addition to the "rarities" took the form of "a strange creature called ourang outang," which had

to be accommodated in the surgeons' hospital until a room could be prepared for it in the College. About the same time there visited Edinburgh "ane heigh great beast, callit ane dummodary, quilk being keepit clos in the Canongate, none had a sight of it, without three pence the person. . . . It was very big, and of great height, cloven futted like unto a kow, and on the bak ane saitt, as it were a sadill to sit on. Thair was brocht in with it ane lytill baboun, faced lyke unto an aip."[8]

During his second period of office as President, in 1699, Menteith was deposed by the Lords of the Secret Council, at the instance of the magistrates, ostensibly as a result of a dispute about one of the steps in his election as representative of the Incorporation in the Civic Council, but more probably on account of his sympathies with the Jacobite cause, to which he was hereditarily attached, being the son of James Menteith of Auldcathie, the representative of the Stuart line of Earls of Menteith, who were staunch friends of the old royal family of Scotland.

For some reason, probably a want of co-operation with the corporate body of surgeons, Menteith's anatomical venture does not seem to have prospered, and after three years he abandoned the teaching of anatomy and commenced a course of instruction on chemistry.

The Surgeons' Anatomical Theatre.

Meanwhile, the Incorporation has obtained for themselves a further supply of anatomical material —"the bodies of fundlings who dye betwixt the tyme that they are weaned and thir being put to schools or trades; also the dead bodies of such as are stiflet in the birth, which are exposed, and have none to owne them; as also the dead bodies of such as are *felo de se*, and have none to owne them; likewayes the bodies of such as are put to death by sentence of the magistrat, and have none to owne them." This very liberal grant was made, however, expressly upon conditions "that the petitioners shall, befor the terme of Michallmes 1697 years, build, repaire, and have in readiness, ane anatomicale theatre where they shall ,once a year (a subject offering) have ane public anatomicale dissection as much as can be showen upon one body, and if the failzie thir presents to be void and null."

The Incorporation proceeded to carry out this obligation; the surgeons' anatomical theatre was completed within the specified time, and arrangements were made for conducting the public dissections, the first of which mentioned in the surgeons' records took place in 1703. The accounts of these dissections that have come down to us are scanty, but full of a weird interest, and we can imagine a

scene not unlike that depicted by Rembrandt in his *Lesson on Anatomy.* They were to take place in the winter between the two equinoxes "allenarly" (only); the right of being present was reserved to any of the magistrates who thought fit; any friend who desired might require the body to be buried if he refunded "to the Kirk Treasurer what expenses he hath been at upon the said deceased persons." Some idea may be formed of these expenses from certain entries of disbursements found in the accounts of the treasurer: "To the Suttimen for carrying the body from the gibbet to the church 17s. 6d. To the two sentineles for six days attendance £4. 7s. For weights for weighing the body 9s. 6d."

To admit of the body being buried within the specified ten days, the work of dissection and exposition was divided among a number of operators, each of whom dealt with a particular subject allocated to him by the College. Much against the wish of the surgeons the attendance at the demonstrations was restricted to the regular apprentices and pupils of the freemen, a wise provision on the part of the Town Council that they should constitute a formal course of anatomical instruction.[7]

Eight members took part in the first public dissection—James Hamilton, John Baillie, Alex-

ander Menteith, David Fyfe, Hugh Paterson, Robert Clerk, James Auchinleck, and Dr. Pitcairn, and the calling, being satisfied with the way in which their duties had been performed, publicly thanked them and ordered "that the same be inserted in their books there to remain *ad futuram re memoriam.*" The following year another dissection was carried out in the same way by James Hamilton, John Mirrie, Mr. Alexander Nisbet,* George Dundas, Robert Swintoun, Henry Hamilton, Robert Eliot, John Jossy, Walter Potter, and Dr. Archibald Pitcairn.

The following year, 1705, ROBERT ELIOT represented to the Incorporation that, in view of certain designs which an outsider had on the public teaching of anatomy, it was desirable that they should elect one of their number to instruct their apprentices and servants. For this office he offered himself, and was accepted. In this way the teaching of anatomy passed into the hands of one man selected for the purpose, and under the authority of the Incorporation. The Town Council confirmed this arrangement and appointed Eliot Professor in the Town's College at an annual salary of fifteen pounds. His duties included those of Conservator of the Museum, for he was to "take exact notice

* The prefix "Maister" indicates that he was a Master of Arts.

and inspectione of the rarities in the colledge," and to make "an exact inventar of the same." Thus the name of Robert Eliot comes to stand at the head of the official list of Professors of Anatomy in the University of Edinburgh.

In 1708, Eliot obtained permission of the Town Council to have ADAM DRUMMOND conjoined with him in the teaching of anatomy, and the Incorporation gave its approval. Drummond, who became President of the surgeons about 1748, was a member of the old Perthshire family, the Drummonds of Megginch, and his father was one of the commissioners to inquire into the massacre of Glencoe. He continued to collaborate with Eliot for seven years and to enjoy half the salary of the Chair.

On the death of Eliot in 1716, JOHN M'GILL, the Deacon of the calling, was appointed to be Professor in conjunction with Drummond, and this copartnership existed till 1720, when, "as the state of their health and business were such that they could not attend the said professorships," they resigned in favour of Alexander Monro, whose advent to the Chair of Anatomy opened a new era in the history of the Edinburgh School of Medicine.

CHAPTER III

THE FOUNDATION OF THE FACULTY OF MEDICINE IN THE UNIVERSITY

Foundation of the Town's College, 1582 — Faculty of Medicine, founded 1726 — Alexander Monro *primus* —His Introductory Lecture—The Original Faculty of Medicine.

King James VI., the founder of the "College of Edinburgh," or "the Town's College," granted a Charter of Erection in 1582, and so satisfied was he with the early progress of the infant University that some years later he "thoct it worthie to be honoured with a name of his awin imposition," by which name—the "College of King James"—it was long called.

Nearly a century and a half elapsed, however, before the teaching of medicine received academic recognition by the foundation of a Faculty of Medicine within the University, when the first of the great dynasty of the Monros became Professor of Anatomy. This was in 1726. It is true that in 1685 the Town Council adopted certain "Acts"

appointing three Professors of Medicine, but as these were neither granted salaries nor assigned duties, the appointments appear only to have been titular. A Physic Garden had been established some time about the year 1668, "in ane inclosure of some forty foot of measure in every way, obtained of John Brown, Gardener of the North Yardes of the Abby of Holyrood," and the subject of botany was taught in the University as early as 1676 the Professor, for a fee of one guinea, undertaking "to attend upon the apprentices in the garden and demonstrate the plants whensoever they should have inclination, and to wait upon them at a solemn public herberizing in the feilds four severall times in every year."

Prior to the foundation of the Medical Faculty, such systematic instruction in the various branches of medical science as was available in Edinburgh was given by "private lecturers" under the auspices of the Incorporation of Surgeons, in what is now known as the Extra-mural School. For long the only subject which seems to have been deemed worthy of special study in the schools was anatomy, and this the surgeons naturally cultivated as the scientific basis of their special work. Their apprentices learned the practical or clinical part of their business as they assisted their masters in their shops and accompanied them on their daily rounds. A

ALEXANDER MONRO *primus*
Professor of Anatomy.

(From an engraving by T. Cook (1786), after A. Ramsay, in the Collection of the Royal College of Physicians of Edinburgh.)

LORD PROVOST DRUMMOND

(From a painting by Alexander (1752), in the possession of the Managers of the Royal Infirmary.)

course of chemistry was started by Menteith in 1697, and later extra-mural classes on Theory of Physic, Practice of Physic, and Midwifery were established.

To JOHN MONRO belongs the credit of having instigated the authorities to organize a complete system of medical education within the University. This "far-seeing and good man," after serving with the army of King William in Flanders, had settled in practice in Edinburgh, and joined the surgeons in 1703. He had for long entertained the idea of "founding a Seminary of Medical Education in his native country," and about the year 1720 formulated a plan which was favourably received by the medical corporations of the city. In his only son he recognized, with a paternal insight more than usually discriminating and wholly altruistic, the instrument by which his cherished dream might be realized, and he lived to see the Medical School of Edinburgh safely launched on its great career, his son Alexander guiding its destinies with a success worthy of his talents.

ALEXANDER MONRO PRIMUS
(1697-1767)

For the rôle which his father had designed for him ALEXANDER MONRO *primus* received a preparation which was carefully planned and thoroughly carried out. To supplement the preliminary train-

ing he had obtained in the Edinburgh School, he proceeded to London, where he became a favoured pupil of Cheselden, whose originality of mind and dexterity of hand inaugurated a new era in British surgery. In Paris he continued his studies in anatomy and surgery under Bouquet and Thibault, and at Leyden he came under the spell of the great Boorhaave, a man whose authority profoundly influenced Monro's mind and was a potent factor in moulding the traditions of the Edinburgh School.

On his return to Edinburgh in 1720, at the age of twenty-two, on the recommendation of the College of Surgeons, Monro was elected to succeed M'Gill, who had resigned the Chair of Anatomy. An interesting story is told of how Monro "found himself" as a lecturer. To lend éclat to the occasion of his introductory lecture, his father, unknown to Alexander, had invited "the whole of the surgeons and apothecaries, and the members of the Royal College of Physicians, with their President at their head. It was certainly an arduous task for a young anatomist to appear as a teacher in such an assembly. The emotions which he felt on this occasion tinged his cheeks with the glow of modest diffidence, and the presence of his auditors effaced the words of his intended discourse from his memory." Having committed his lecture to

memory, he had left his notes at home, and "in this dilemma . . . he began to show the preparations which lay before him ; the signs of the things signified arranged themselves in his mind, and the utterance immediately followed. This experiment succeeded so well that Monro ever afterwards accustomed himself to extemporaneous delivery."[12]

In 1725, a rumour having got abroad that the graves in the Edinburgh churchyards were being desecrated, an angry mob threatened to wreck the anatomy rooms at Surgeons' Square, where Monro conducted his classes, and in fear of having his precious preparations destroyed, he removed them to more secure keeping in the University, where he lectured henceforward. Thus it came about that the Surgeons' Theatre ceased to be the official centre of anatomical teaching in Edinburgh, and the link which bound the surgeons to the University was violently broken.

Monro's great achievements as an anatomical investigator and teacher do not concern us here. He amply fulfilled the highest hopes even of his father, and now enjoys the title (which might surely be shared with his devoted parent) of "the father of the Edinburgh School."

It cannot be claimed that he left his mark on the surgery of his day, for although his course of instruction included the demonstration of opera-

tions on the dead body and the use of various bandages and appliances, and he frequently attended at the hospital and "gave lectures on the chirurgical cases," he does not appear ever to have practised as an operating surgeon, and the papers he left on surgical subjects relate chiefly to morbid anatomy and pathology. In another direction, however, he conferred an inestimable boon on surgery, for with Lord Provost Drummond he was the moving spirit in founding the Royal Infirmary.

Monro *primus* held the Chair of Anatomy for thirty-eight years, and died in 1767, at the age of seventy.

During the five years that Monro continued to lecture in the Surgeons' Hall after being appointed Professor, he gathered round him a small band of teachers who came to form the nucleus of the Medical Faculty, which was formally organized a year after he migrated to the University classrooms. Dr. St. Clair lectured on the Theory of Physic; Drs. Rutherford and Innes on the Practice of Physic; and Dr. Plimmer on Chemistry. These gentlemen, on being made Professors in 1726, together with Dr. Alston, the Professor of Botany and Materia Medica, and Dr. Joseph Gibson, who was elected to the newly-created professorship of Midwifery, constituted the original Faculty of Medicine in the University.

CHAPTER IV

THE ROYAL INFIRMARY

George Drummond — "The Physicians' Hospital" — The Royal Infirmary—The Surgeons' Hospital—Amalgamation—The Building of the Old Infirmary—The New Infirmary.

When the Medical Faculty was founded Edinburgh was still without a public hospital where the Professors could supplement the systematic discourses of the class-room by practical instruction given at the bedside of the sick. The want of such facilities for demonstrating to the students and apprentices the phenomena of disease and the appropriate methods of treatment was keenly felt by the teachers, while the students lacked that human interest in their work which comes from being brought into actual contact with sick people in the wards of a hospital.

It must not be inferred that the requirements of the necessitous poor had hitherto been neglected in Edinburgh. From time immemorial the magistrates had been in the habit of making provision for those

of the sick poor who were "free of the city" by granting them small pensions and providing a physician and surgeon to attend them at their own homes. For those who were not "burgesses," and therefore did not enjoy the freedom of the city, provision was made by members of the Incorporation of Surgeons and of the College of Physicians giving their services gratis, and for many years an arrangement existed by which two members of the College of Physicians in turn gratuitously gave advice and medicine to necessitous persons in the College hall. These arrangements, however, were insufficient to meet the requirements of those suffering from severe forms of illness, nor did they provide an efficient means of imparting bedside instruction to the increasing number of students who were being attracted to the School.

The first tentative effort to provide hospital accommodation was made in 1721, when a number of charitably disposed persons made an attempt to raise funds to open a small hospital in which the most necessitous cases might be treated, but for various reasons this movement did not meet with success. In 1725 the proposal was renewed under more favourable auspices. GEORGE DRUMMOND, one of Edinburgh's most public-spirited citizens, had just been elected Lord Provost (p. 23). A man of outstanding ability, Drummond had, while still a

youth of eighteen, evinced his genius for affairs by settling the national accounts of Scotland preparatory to the legislative union of the two kingdoms; and in the various national and civic offices which he subsequently held he secured the complete confidence of his countrymen by the breadth of mind and largeness of heart he brought to bear on the discharge of his public duties. To him we owe the inception of most of the improvement schemes which have transformed "the worn-out little capital" of Scotland that survived the '45 into the fair city we know to-day. Into none of his projects did Drummond throw himself more wholeheartedly than into that of establishing a hospital for the benefit of the sick poor. In his lifelong friend, Alexander Monro, the Professor of Anatomy, he found an enthusiastic coadjutor, and to these two men belongs much of the credit of establishing the Royal Infirmary of Edinburgh, which was destined to become one of the most famous medical institutions in the world. In the entrance hall of the present infirmary stands a bust by Nollekens, bearing the inscription: "*George Drummond, to whom this country is indebted for all the benefit which it derives from the Royal Infirmary.*"

With Scottish caution a modest beginning was made, the sum of £2,000 being arrived at as "the

least sum with which the erection of an Infirmary can be set about." It so happened that a certain Scottish fishing company was being dissolved about this time, and through the influence of the Lord Provost a part of the capital was assigned to the promoters of the hospital scheme. This money, together with contributions from the College of Physicians and the Incorporation of Surgeons, and subscriptions from the general public, soon provided the necessary funds, and the managers "took a lease for nineteen years of a house of a small rent near the College, which was made more agreeable and convenient by the Professors of Medicine granting liberty to the patients to walk in a garden adjacent." The hospital was opened in 1729, and during the first year of its existence the number of patients admitted was thirty-five, of whom only one died. In its early years the infant infirmary owed much to the fostering care of the College of Physicians, who "nursed it as a child of their own." Their undertaking that "ane or more of their number shall attend the Hospital faithfully and freely, without any prospect of reward of sallary," was loyally carried out. In other ways they gave generous support, and so closely did the institution become identified with the College that it was popularly known as "the Physicians' Hospital."

That the surgeons *as an Incorporation* took a

less active share in the management and working of the hospital in its earliest days was due to certain difficulties which arose regarding the method of selecting the surgical members of the staff, and not to any want of sympathy with the movement or lack of philanthropic spirit. The Incorporation as a body indeed offered to furnish medicines and operative treatment gratis to the sick and wounded in the hospital for a period of two years, but this offer was rejected by the managers in favour of another made by Alexander Monro and five other surgeons, who agreed individually to attend in turns, each acting as "ordinary" for two months at a time, "and dispensing out of our own shop as we do to other patients the medicines, whether external or internal, prescribed by the physicians for the sick poor, and that gratis, renouncing all claim to payment of accounts or of fee." This plan, although it limited the choice of surgeons and restricted the privilege of acting on the staff to the six selected members, seems to have worked satisfactorily, and the hospital soon gained the confidence alike of the sick poor and the charitable public.

In 1736, the managers presented a petition to King George II., praying that he should grant to the contributors a Royal Charter, erecting them into a corporation. In this petition it was set forth that the purpose of the hospital was for the treat-

ment of "poor sick properly recommended from any part of the country, who are not absolutely incurable," and that they should be "taken care of by the Royal College of Physicians of Edinburgh, and some of the most skillful surgeons." This petition was granted, and the same year the contributors were erected into a body corporate by the name of the Royal Infirmary of Edinburgh.

Meanwhile, the Incorporation of Surgeons, who keenly felt their exclusion from the service of the new Infirmary, decided to establish a hospital under their own auspices, "to alleviate the deplorable condition of the many indigent and diseased poor who languish under various diseases, and are ready to perish for want of that timely assistance which they might find in a hospital erected for their entertainment." They did not profess that they were entirely moved by this altruistic consideration, for they avowed that "the benefit of their apprentices and students was a considerable motive to them" in making this proposal. In this as in all their actions the Incorporation of Surgeons consistently kept the idea of teaching prominently in mind. The Surgeons' Hospital was opened in 1736, and it was no less successful than its older rival had been, the demands for admission proving that there was ample scope in Edinburgh for both institutions.

It soon became evident, however, that the dual

arrangement was neither economical nor for the best interests of the medical school, and in 1738 the Surgeons' Hospital threw in its lot with the Royal Infirmary, one of the conditions of the union being that all the members of the Incorporation should be eligible to act on the staff, under such regulations as the managers might make.

The demands on the infirmary soon outran the capacities of the modest "house of small rent," opened in 1729, and a movement was set on foot to erect a hospital worthy of the capital of Scotland and of its rapidly growing medical school. Drummond and Monro were again the moving spirits, and their enthusiasm became contagious. Never was seen in the whole history of philanthropic effort anything more remarkable than the sympathetic outburst of energy by the whole of a community. "The proprietors of many stone-quarries made presents of stone, others of lime; merchants contributed timber; carpenters and masons were not wanting in their contributions; the neighbouring farmers agreed to carry the materials gratis; the journeymen masons contributed their labours for a certain quantity of hewn stones; and as the undertaking was for the relief of the diseased, maimed, and lame poor, even the day labourers would not be exempted, but agreed to work one day in the month gratis towards the erection of the

building. The ladies also assisted in their way: they appointed an assembly for the benefit of the work, which was well attended, and everyone contributed bountifully."[22] The Lord Provost himself went to the Mercat Cross, the place where merchants and others assembled on the Saturdays, to solicit subscriptions for carrying on the work.[12] He and Monro not only formed the "building committee," but personally supervised every detail of the work, and actually paid out the wages of the masons with their own hands.

The foundation-stone was laid in August, 1738, and in 1741 the building was ready for the reception of patients. Designed in the Scoto-French style of the eighteenth century, the building consisted of a central block with side wings. The graceful façade was surmounted by a dome and lantern dome, and in an alcove over the main entrance stood "a full-length statue of George II. in a Roman dress, with an inscription on either side: 'I was naked and ye clothed me.' 'I was sick and ye visited me.'" When Dr. Samuel Johnson visited the infirmary in 1773, his attention was attracted by a board at the main doorway bearing the inscription "Clean your feet." He slyly remarked to Boswell, who had just conducted him over St. Giles: "There is no occasion for putting this at the door of your churches."

In the centre of the boundary wall facing Infirmary Street was an ornamental gateway, evidently not intended for carriage traffic, as it was reached by a flight of steps, and was never known to have been opened.

Among the architectural features that arrested attention at the time was the central staircase, which was "so spacious as to admit of sedan-chairs being carried up it." In addition to "cold and hot baths for the patients," a marble bath was provided for the use of the citizens, and this for many years was the only public bath in the city. In 1822 it was used by King George IV., after which the "royal bath" became so popular that the city instituted public baths outside the infirmary.

Great care was bestowed on the arrangements made for the accommodation of the patients, and "in the disposition of this whole building nothing has been more anxiously studied than ventilation."[15] Accommodation was provided for 228 patients, "each in a distinct bed," and "the apartments of the male and female patients were entirely distinct." Wards were provided for lying-in women; for "female patients undergoing salivation," a small room for female patients requiring the same treatment, "who, being sufferers not by any fault of their own . . . had applied to be taken under cure in the hospital"; and "cells for mad people." Later, a ward was fitted up for the use of sick servants.

In the central part of the building under the dome the operating-theatre was situated. It was capable of accommodating 200 students, and has been described as "steep, well-like, and sombre," with dark woodwork and walls and a compressed area. In these dismal surroundings was performed much of the brilliant surgical work of John Lizars, William Fergusson, Robert Liston, and James Syme.

Some years after the new building was opened, the Lords of the Treasury gave to the infirmary a grant of £8,000, in return for which the managers kept sixty beds constantly in readiness for the reception of soldiers. During the rebellion of 1745 several hundreds of wounded and sick soldiers were treated in the hospital. For many years a military guard was mounted at the infirmary.

Among the pious benefactors whose generosity is commemorated on the panels in the corridors of the infirmary, many were famous in Scottish history, but many more were humble citizens whose modest contributions represented the hard-earned savings of a lifetime.

It is recorded in the history of the infirmary[21] that "in 1768 the Royal Infirmary was furnished with an electrical conductor. . . . This precaution against future accidents by thunder was taken in consequence of the house having suffered consider-

ably by lightning a few months before. . . . One of the physicians, while examining a patient, was affected as if he had been struck with a large pillow full of soft down."

It is unnecessary to trace the structural changes which the ever-increasing reputation of the infirmary called for: the absorption of the High School buildings, the erection of the new surgical hospital with its improved operating-theatre, designed by Bryce, in 1852, the building of the Lock Hospital, its conversion into a fever hospital, and finally the transfer of the whole Institution to the new site at Lauriston, where the present building was opened in 1879, by Lord Provost Boyd, who had taken a prominent part in providing for its erection.

The closing scene in the old infirmary took place on a cold dark evening towards the end of October, 1879, when the residents gathered round the table in the great operating-theatre for the last time, and in

"a wild mysterious strain of weirdest harmony"

sang "Auld Lang Syne" in solemn cadence.[64]

On the architect's plans of the original building, signed "*Gul: Adam, inv: et delin,*" is this legend: "This hospital will be open to all curcable distressed from whatever corner of the world they come without restriction." *Patet omnibus* is the motto over the portals of the Royal Infirmary to-day.

CHAPTER V

THE PERIOD OF THE PRACTITIONER-SURGEONS

Surgery during the Reign of Monro *primus*—Alexander Wood—Old Edinburgh Medical Clubs—Anecdotes—John Bennet—Medical Duels—Anecdotes.

DURING the first half of the eighteenth century, while the medical world of Edinburgh was dominated by the first Monro, surgery was relegated to the position of the step-child among the medical sciences. The subject was taught, in so far as it was taught at all, in a few perfunctory lectures at the tail end of the course of anatomy; the Professor himself was not even a practising surgeon. Not only so, but the University actively opposed various efforts made by the College of Surgeons to improve matters. It is little wonder, therefore, that few names stand out prominently in the surgical history of this period, and those that have come down to us were rather general practitioners, who had a predilection towards surgical work, than surgeons devoting themselves to the practice of the art and to promoting its progress. Of these, two

BENJAMIN BELL
Surgeon, Edinburgh.

(From an engraving by W. and I. Walker, after Raeburn (1791). *Lent by Miss Bell.*

ALEXANDER WOOD
Surgeon, Edinburgh.

(From an engraving by Maddocks, after Aikison, in the Author's Collection.)

may be mentioned—Alexander Wood and John Bennet—both belonging to what may be called the class of practitioner-surgeons, and remembered as much for their eccentricities and convivial tendencies as for their surgical achievements.

Alexander Wood
(1725-1807)

"Oh, for an hour of him who knew no feud—
The octogenarian chief, the kind old Sandy Wood."[92]

While it must be admitted that the fame of "Lang Sandy Wood" rests more on his marked individuality and amiable social qualities—and, be it added, his genially convivial habits—than on his eminence as a surgeon, his memory is still one of the cherished traditions of the Edinburgh School. If he made no memorable contribution to surgical knowledge, he did much to sweeten the social life of his medical brethren, and to soften the asperities which too often marred the harmony of professional life in his period. Himself the most clubbable of men, he was a moving spirit in founding various of the medico-social societies that still survive and form one of the most pleasant and characteristic features of medical life in Edinburgh. The practices and manners of these coteries have changed with the changing times, but the spirit of Sandy Wood still pervades them. He was the

chief instigator of the Gymnastic Club (1786), the members of which met annually at Leith to celebrate the "Ludi Appolinaris" and to compete with each other at "gowfing, bowling, and swimming." In all these exercises Wood excelled, and although he lived beyond his eightieth year he was a keen "gowfer" to the end. This club was dissolved in 1811, but its medals and pocula still adorn the table of the Æsculapian Society on guest-nights.[23]

In the Poems of Andrew Duncan (1818) we find "a song composed on a memorable event in the annals of the Gymnastic Club."[24]

"Here lies Sandy Wood, a good honest fellow,
Very wise when sober, but wiser when mellow;
At *sensible nonsense** by no man excell'd,
With wit and good humour dull care he repell'd.

"But though now he's laid low, we must not complain,
For, after a sleep, he'll be with us again.
Shed no tears, my good friends, wear no garments of sable;
Sandy Wood is not dead, but laid under the table."

A rhyming explanation of this "memorable event" was subsequently forthcoming which, while admitting that

"'Tis true that ance in evil hour
Beneath the table he did cour,
Which rais'd the tale, you may be sure,
That we had lost our Sandy,"

* A free translation of the *jeu d'esprit* of the French.

went on to offer the excuse, always considered valid in these days, that

> "It was a glass that laid him low—
> A glass his friend, and not his foe."

Many tales are extant of similar adventures which befel Lang Sandy and his cronies in these gay times, but they must be judged in the light of the manners and customs of the period. These were the days when the taverns of the High Street were the only meeting-places alike of sedate medical societies and of such dare-devil reunions as the "Sulphur Club," the "Hell Fire Club," and the "Demireps." Daily at half-past eleven the "gill-bells" rang from St. Giles to call the citizens to their "meridian," which consisted of a gill of brandy or a glass of ale, and by four o'clock "lords, lawyers, and lairds" had assembled for dinner, thereafter to enjoy their "high jinks" well into the early hours of the morning.[25]

Throughout his long life "he could toil all the day, and yet laugh all the night," and the "Sons of Æsculapius" solemnly conferred on Mr. Wood the diploma of "Doctor of Mirth" on April 12, 1813. In a period when "originals" abounded in Edinburgh, and when it was not considered an affectation for a citizen to retain his own peculiarity of gait or dress, or to express his individuality by any whim of mind or action, Wood was a striking

personality as he wended his way down the closes and up the scale stairs of the city accompanied by a pet sheep and a raven.[27] John Kay[26] represents him passing along the North Bridge, in periwig and cocked hat, with an umbrella under his arm, "in allusion to the circumstance of his having been the first person in Edinburgh who made use of that very convenient article."

It is related of Wood that when he sought of her father the hand of Miss Veronica Chalmers, in reply to the question how he was to support a wife and family, he drew from his pocket his lancet-case and said: "I have nothing but this, sir, and a determination to use my best endeavour to succeed in my profession."

"Vera is yours!" rewarded this spirited reply. The incident illustrates a pleasing sincerity and frankness, amounting at times to bluntness, which characterized him throughout. Many years later, when by the assiduous use of his lancet and of more ambitious implements of surgery he had gained such a position that he met in consultation on equal terms with the great Dr. Cullen, it is recorded that on one occasion he commented on the great physician's prescription of certain pills in these terms: "Oh, doctor, doctor, Nature has already done her work, and the patient is saved. As for your pills, ye may just as weel gie him some pease meal."

It has been said of Wood, as it was of Boorhaave, that "he considered the poor his best patients, and never neglected them." His popularity with the lower classes on one occasion stood him in good stead. During a street riot directed against the Lord Provost of the day, some of the mob mistook Mr. Wood for the head of the municipality, whom he closely resembled in figure, and, seizing him, were about to throw him over the parapet of the North Bridge, when he cried out, "I'm lang Sandy Wood; tak' me to a lamp-post, and ye'll see." His identity having been verified, he was cordially cheered and protected from further violence.

While Wood's fame as an operating surgeon did not spread far beyond his native city and did not long survive his own day, he was until within a few years of his death universally recognized as the leading surgeon in Edinburgh, and "the dexterity of his skill in operating tended much to raise the reputation of the surgical department of the Royal Infirmary."

Wood lived to the age of eighty-two, and died on May 12, 1807. Almost without interruption his descendants have ever since worthily represented the best traditions of the medical profession in Edinburgh. His grand-nephew, Dr. Andrew Wood (1817-1884), introduced the practice of hypodermic medication and invented the hypodermic syringe.

JOHN BENNET
(*d.* 1805)

Another member of what may be called the convivial school of Edinburgh surgeons flourished some time later than Alexander Wood. John Bennet's professional success appears to have been due more to his "polish and pleasant manners," and his "occasional indulgence in those excesses and frolics which were then deemed extremely fashionable," than to his purely surgical achievements.[26] Soon after he began practice one of the numerous escapades in which he figured enabled him to "set up his carriage." A highly respected citizen, while in convivial company, threatened to cut his own throat; one of his cronies, lifting a knife, said, "I will save you the trouble," and "very nearly converted jest into earnest by making a severe incision." Mr. Bennet's treatment of the wound was so successful that the assailant presented him with "an elegant chariot." This same vehicle was the indirect cause of another of Bennet's escapades. Being in need of repair, it was sent to the coach-yard of the firm of Crichton and Field. Mr. Bennet and Mr. Field had some words about the matter, which culminated in the coach-builder challenging the doctor. Bennet refused to meet Field on the ground that "his rank was not that

of a gentleman." At this point Field's partner, Colonel Crichton, appeared, and, taking the quarrel upon himself, renewed the challenge. Bennet, the former surgeon to the Sutherland Fencibles, could not refuse the challenge of the Colonel of the East New Town Company of Edinburgh Volunteers. They met; the Colonel was wounded; "the ball, which entered near the left side of the chest, passed through part of the pectoral muscle and came out behind, near the edge of the bladebone. The wound was severe, but not dangerous, and he speedily recovered."

In 1805 Bennet took part in another duel, but not as a principal. This is the report of the affair published at the time: "On Wednesday morning, July 3, a duel was fought, in the neighbourhood of Duddingston, between Mr. Romney and Mr. Leckie, students attending the medical classes in the University, when the latter received a wound in the groin, in consequence of which he died next Saturday morning. Four shots were, we understand, exchanged. Mr. Leckie received his wound by the first fire, but did not discover it. After shaking hands with his antagonist, he declared he was mortally wounded, and desired Mr. Romney, the seconds, and the surgeon who attended, to make their escape, which they accordingly did." For his kindness and attention to Mr. Leckie,

whose father was the senior magistrate of Londonderry, Mr. Bennet had the freedom of that city conferred upon him.

Bennet was given to practical joking, which was one of the fashionable frolics of the period. Having on one occasion lost a wager, he had to entertain a number of friends to "dinner and drink" and a visit to the theatre. At the hour appointed for leaving the festive board of "a house of good cheer at Leith," he had provided, instead of ordinary hackney-carriages, a number of mourning-coaches, in which the party were driven off in slow time, "amid the wonderment of a numerous crowd, who were no less astonished at the mirth of the mourners than amazed at the place where the procession halted."

Many stories are extant of his whims and pleasantries, but nothing of his surgical achievements.

He met a tragic fate. Having gone to enjoy a day's shooting in the autumn of 1805, he was found dead in a field near his friend's house, with his dog and his empty gun beside him.

CHAPTER VI

THE BEGINNING OF THE SURGICAL SCHOOL

The Rise of the Edinburgh Surgical School—Benjamin Bell, "the Father of the Edinburgh Surgical School"—His Training in Surgery—Surgeon to the Royal Infirmary—His Contributions to Surgery—His *System of Surgery*—John Bell, the Originator of the School of Surgical Anatomy—Literary and Artistic Tendencies—Exclusion from Royal Infirmary Staff—Controversy with Dr. James Gregory—His Surgical Writings—The Doctrine of the Anastomosing Arteries—*Principles of Surgery*—Operation for Iliac Aneurysm.

THE second half of the eighteenth century saw the rise of a definite School of Surgery in Edinburgh. This may be traced to a variety of circumstances. The founding of the Academy of Surgery in France had given a great impulse to surgical progress throughout Europe, and the fame of Petit, Chopart, and Desault attracted to Paris numbers of young Scots, who came back full of enthusiasm and fired with the desire to emulate these masters. In the Royal Infirmary, which was now adequately equipped and in full working order, those who were eligible to act on its staff found greater

opportunities of acquiring clinical and operative experience than had hitherto been available. The thorough training in anatomy which was then the outstanding feature of the Edinburgh teaching enabled them to take full advantage of these opportunities, and the encouragement given to the teaching of surgery by the College of Surgeons induced a number of able young men to devote themselves to the subject. The number of students attracted to the school was gradually increasing, and by their classes the rising young surgeons could hope to maintain themselves until they secured a share of the limited consulting and operative practice which the city and district then provided.

The names of Benjamin Bell, "the father of the surgical school,"[22] and of John Bell, who originated the school of surgical anatomy,[7] dominate this period, although that of James Rae, who was the first to deliver a complete course of lectures on surgery, must not be overlooked (p. 79).

Benjamin Bell
(1749–1806)

Benjamin Bell was born in Dumfries in April, 1749, the eldest son of a family of fifteen.[28, 29] His forbears had held land in Dumfriesshire since early in the fifteenth century, and on both sides

had suffered the penalty of their adherence to the Covenant. His father appears to have been a man of parts, which, however, did not include an aptitude for business, and for a time the fortunes of the house were none too rosy. It is to Benjamin's credit that he did what he could to retrieve them, because it is recorded that early in life he disposed of the estate of Blacket House, to which he had been served heir by his grandfather, in order that the younger branches of the family might be suitably educated.

In the Grammar School of his native town he received an excellent classical education, and was thereafter apprenticed to Mr. James Hill, surgeon in Dumfries, a man of considerable note in his day. In 1766, at the age of seventeen, he was sent to Edinburgh, and came under the influence of the band of illustrious men who at that period formed the teaching staff in the University. The first Monro was still a lecturer in clinical surgery and medicine in the Royal Infirmary; Monro *secundus* was teaching anatomy; William Cullen held the Chair of Institutes of Medicine; John Gregory that of Practice of Physic; John Hope was responsible for the teaching of botany, and Joseph Blake had just become the Professor of Chemistry.

The study of anatomy particularly attracted young Bell, and he seems to have pursued it with

the deliberate object of applying his knowledge to the practice of operative surgery. In 1770 (*21*)* he became a Fellow of the Royal College of Surgeons, and a letter written to his father relative to a plan he had conceived of proceeding to Paris to continue his surgical studies indicates very fairly the position of the Edinburgh School of Surgery at this time. "To be sure," he says, "medicine is taught in Edinburgh in greater perfection than in any other part of Europe, or, indeed, of the whole world; but notwithstanding there are some particular branches which are to be had in Paris, and nowhere else, and which cannot possibly be got in Edinburgh, and particularly with regard to surgery, which I have now the prospect of applying pretty closely to, and upon which I am now altogether, for some time at least, to depend. Had I been now entering to the world as a physician, I should never have thought of going farther than where I have been; but for a *surgeon*, I assure you, Edinburgh comes greatly short of either Paris or London, and for that reason Dr. Monro and any others that I have spoke to here upon the subject approve of the scheme very much."[28]

After much discussion of ways and means, this project was carried into effect, and the next two

* The italic figures in brackets indicate throughout the age of the subject at the date mentioned.

years were spent in the great surgical schools of Paris and London. In the latter city Bell made the acquaintance of John Hunter—"the most agreeable and at the same time the most useful acquaintance I ever met with"—and studied anatomy under William Hunter, whom he found "by no means so free or so ready of access as his brother."

On his return to Edinburgh, at the age of twenty-three, he set up in practice. Acting with that strict regard for business principles which marked all his dealings, he acquired, from one who was about to relinquish practice, his shop, "drawers, counters, mortars, and all," and established himself in a humble dwelling above the shop. His sister Rebecca was installed as housekeeper, and by the exercise of those habits of frugality with which their upbringing had made them familiar they managed to get along very comfortably. Regular supplies of dairy produce came by the Hawick carrier from Woodhouslees, and in return Ben furnished such simple medical advice as the home folks required: bark for his mother's headaches—"as much as easily lies on a shilling four times a day"; scarification of the gums of "little Eben," who was teething; and baths for one sister "freely" and for another "with caution." "With regard to the use of the cold bath," he writes, "in a variety

of diseases it is a most excellent remedy, and even people in health are not the worse for it." Without adventitious aid or influence Bell speedily acquired a reputation and a practice, and before he had been established a year in Edinburgh he had the singular good fortune to be elected surgeon to the Royal Infirmary at the early age of twenty-four, and this office he held for twenty-nine years. Three years later his position was so far assured that he felt justified in assuming further responsibilities, and married Miss Grizel Hamilton, the only sister of Dr. James Hamilton, who had been his companion during his visit to Paris. Soon after his marriage he had the misfortune to fall from his horse, and sustained injuries which laid him aside for nearly two years, during which time he retired to the farm of Liberton on the eastern slope of the Braid Hills, about three miles to the south of Edinburgh. Under the kindly and skilful treatment of Alexander Wood, to whom in gratitude he dedicated the second volume of his *System of Surgery*, he so far recovered as to be able to resume his work in Edinburgh, and from this time on his success was unbroken. During many years "he was more employed than any other surgeon in Scotland," and "at one time nobody could die contented without having consulted Benjamin Bell." Among his many distinguished patients was

Admiral Duncan, the hero of Camperdown—whereby hangs a tale. Arriving on one occasion at an English port, Bell was no less alarmed than astonished when a band of sailors unloosed the horses from his post-chaise and dragged him in triumph through the town. It turned out that these fine fellows, many of whom had served under Admiral Duncan, had somehow learnt that the health of their idol had been restored by Bell's surgical skill, and they took this rough and ready method of expressing their gratitude.

The strain of a busy professional life, added to the ill effects of the accident which interrupted his early career, and from which he never seemed to have quite recovered, and accentuated by many minor worries connected with the management of various properties he had acquired, told upon his health, and in 1804, he had become so feeble that a few professional visits each day were all he could accomplish. At the comparatively early age of fifty-seven he died at Newington House on April 5, 1806.

Contemporary evidence all goes to show that Benjamin Bell was an outstanding figure in the surgical world of his time (p. 39). In John Kay's *Edinburgh Portraits* he is depicted as a short, thick-set man, burly without being corpulent, with pleasing features, clean-shaven, and a full crop of

wavy hair falling over his collar. He wears the knee-breeches, silk stockings, and silver-buckled shoes of the period, a long, full swallow-tailed coat with lace ruffles at the neck and wrists, and a broad-brimmed beaver hat, and carries in his hand the traditional gold-headed staff of the physician. "His address was mild and engaging, his information varied and extensive, and his powers of conversation such that his society was much courted."

James Wardrop, speaking of Bell as he remembered him in the year 1796 (*47*), says: "His manner was devoid of every kind of ostentation. He was of a kindly disposition, and in stating his opinion made use of very plain and accurate language. He had an impressive mode of expressing himself, giving great assurance and confidence to the sick. In all the excitement of a surgical operation he displayed the greatest composure. He was one of the best and shrewdest observers I have ever known."

No sketch of Benjamin Bell would be complete which omitted reference to his interest in practical agriculture and political economy, subjects on which he published several essays which received the commendation of no less an authority than Adam Smith. He has been referred to as "the sage and prophet of some of the most remarkable of the political reforms that have occurred between his time and our own." He was also a bold and

successful speculator, and at the time of his death he owned the greater part of the suburb of Edinburgh which goes by the name of Newington. This tendency, his biographer suggests, may be traced to his relationship to William Paterson, his great grand-uncle, the founder of the Bank of England and the originator and chief promoter of the "Darien Scheme."

His descendants through several generations continued to hold prominent positions in the Edinburgh Medical School, the last of the race being Dr. Joseph Bell, who died in 1911, and who, having served as Syme's house-surgeon, brings the race of Bell up to the time of Lister.

While it cannot be claimed that Bell stands in the very front rank of scientific surgeons, it must be admitted that in his day and generation he contributed materially to the progress of his art. He brought to bear upon his work a faculty of accurate observation, and an open, alert, and speculative mind that enabled him to draw clear deductions, which proved of great clinical and practical value.

Early in his career he realized that the ends the surgeon has in view are in general attainable by very simple means, and in his practice he made a laudable endeavour "to divest the art of all the useless machinery" with which it had become encumbered, and which tends "more to evince

the ingenuity of its authors than to render the operations for which it was intended more easily accomplished."

His writings show that through his mind there had passed the first glimmerings of some of the great ideas which, when realized some three-quarters of a century later, changed the whole aspect of surgery. He was one of the first to emphasize the importance of seeking for some means of preventing or diminishing pain in surgical operations, and although the methods he describes in the last volume of his *System of Surgery* seem crude and ineffectual in the light of subsequent developments, they mark a stage in the evolution of this great advance.

In his dissertation *On the Chirurgical Treatment of Inflammation* (1777) (*28*) he lays stress on the danger which results from the admission of air to the contents of large abscesses and other collections of matter, and strongly advocates the use of the seton, a practice which had been recommended by James Rae, a Fellow of the College of Surgeons, and adopted in the Royal Infirmary thirty years before. He offers no explanation of the fact that too frequent dressings and the admission of air each time of changing "tends to retard the cure," and "constantly vitiates the nature of the discharge," but his experience satisfied him that by means of

the seton a cure was commonly obtained in little more than half the time usually found necessary after a large incision had been employed.

His views on the rationale and practice of what is now called "massage" in the treatment of stiff joints following inflammatory conditions were well in advance of those of his own times, and not far behind those of our own. He recommended the persevering use of gentle friction thrice in the day, for an hour each time, not over the joint merely, but over the adjacent muscles, and considered that the friction thus performed was more important than the embrocation employed.

Bell's most important contribution to the scientific literature of surgery was his *Treatise on Gonorrhœa Virulenta and Lues Venerea*, published in 1793 (*44*). In the light of an unusually extensive clinical experience, and from much careful observation and accurate deduction, he clearly demonstrated that the poisons of gonorrhœa and syphilis are essentially different, and that the diseases themselves are specifically distinct. The credit due to Bell of closing the long-standing controversy as to the identity of these diseases is enhanced when we bear in mind that his opinions ran counter to those of no less an authority than John Hunter. Bell's views on the morbid anatomy and treatment of gonorrhœa were singularly en-

lightened and, save for what we owe to the science of bacteriology, the hundred odd years that have elapsed since his treatise was written have added comparatively little to our knowledge of the subject.

In the province of operative surgery he is still remembered for the share he took in improving the methods of amputating. While still a student he was much impressed by the unsatisfactory healing of amputation wounds and by the interference with the usefulness of the stump that so often resulted from the "sugar-loaf" shape of its extremity. These disadvantages he attributed to the fact that sufficient skin was not saved to admit of the muscles and bone being completely covered. To obviate them he devised a method of amputation which he put into practice the first time he had an opportunity of removing a limb, in 1772 (*23*), and which came to be known as "the triple incision of Bell." This was for long one of the approved methods of amputating, and with slight modifications may still be advantageously employed in suitable circumstances.

In amputating through the thigh, Bell employed a long anterior flap, thus anticipating the procedure which many years later came to be associated with the name of Teale of Leeds. "Save skin" was one of his surgical watchwords, and he applied the principle in the removal of tumours and in a variety of other ways.

Bell's most ambitious literary effort was his *System of Surgery*, published in six octavo volumes between 1783 and 1788 (*34-39*). Modelled on Heister's great *System*, published nearly half a century earlier, it was the first attempt in English "to bring together the art of surgery in broad and orderly form," and was designed "to exhibit a view of the art of surgery as it is at present practised by the most expert surgeons in Europe." Despite its singular lack of systematic arrangement, which the author avowed and defended, it furnished a comprehensive, if somewhat diffuse, exposition of the subject, and contained much that was of permanent value. That it went through seven editions, was translated into French and German, and was for long a standard authority alike with students and teachers of surgery, disposes of the inept and callow criticism passed on it by Benjamin Brodie, who, when a lad of nineteen, borrowed it from a friend and found it "a most unreadable production," and doubted "whether it was ever read by anyone." Such an immature judgment might well have been modified when this distinguished surgeon came to write his autobiography in more mature years.[30]

John Bell.
(1763-1820)

The name of Bell has occupied a prominent place in Edinburgh surgery for wellnigh two centuries. It has come down through two lines, the older of which, founded by Benjamin, whose career we have just followed, has been uninterruptedly represented in the School down almost to our own times. The other line, if shorter, is no less brilliant, for it gave us the brothers John and Charles.

Born in Edinburgh, where his father, the Rev. William Bell, was established as a clergyman of the Episcopal Church in Scotland, John was the second of four sons, all of whom attained to positions of distinction in professional life; two became Professors of Law, and the youngest and most famous was the great anatomist and physiologist, Sir Charles Bell.

Endowed with considerable natural ability and prompted by a belief in himself and a determination to succeed, John Bell was destined to take a high position in whatever profession he chose to adopt. As a young man he moved in a social circle which had been strongly influenced by the awakening of intellectual life that took place in Scotland about the middle of the eighteenth

century. The cult of literature became the fashion in Edinburgh, and, following his inclinations no less than his interests, Bell became a devotee. He collected what for that day was an extensive and varied library, and, what was perhaps less common, he read his books, annotating freely on the margins. His well-regulated mind, aided by a retentive memory, enabled him to make use of the varied information he thus acquired, not only in his professional writings, but still more perhaps in his controversial brochures. He was a skilful draughtsman, as the excellent illustrations in his works on anatomy and surgery testify ; and he also cultivated music, "with more taste, however, than execution," it is said, and the musical parties at which he collected the élite of Edinburgh society were among the events of the social season.

He is described as a man considerably below middle height, but exceedingly well proportioned, studiously elegant in his movements, and dressed with excellent taste. He was polished and easy in his manners, his eyes keen and penetrating, and his whole expression intellectual and intelligent in no ordinary degree.*

Strange it seems that this dapper little man should enter on his professional life as the pupil of

* I have failed, after careful search, to find a portrait of John Bell.

Mr. Alexander Wood, better known in his own day, and even in ours, as "Lang Sandy." There seemed little in common between the kindly, convivial, and Bohemian master and the dignified, literary, and artistic apprentice. Yet so it came about, and the association appears to have been a happy one, for Bell, in acknowledgment of his gratitude and affection for Mr. Wood, dedicated to him the first volume of his *Anatomy of the Human Body* (1793).

After completing his professional education, Bell travelled for some time in Russia and the north of Europe, and then settled down to practice in Edinburgh.

In 1786 (*23*) he became a Fellow of the Royal College of Surgeons, a position which at that date entitled him to the privilege of acting in rotation as one of the Surgeons to the Royal Infirmary. In this capacity he early manifested his clinical ability and manual dexterity, and was soon recognized as one of the most skilful surgeons on the staff. In the extra-mural school at Surgeons' Square, where he lectured on anatomy and surgery for ten years (1786-1796), he made a name for himself as a forcible and inspiring teacher. In 1800 a change was made in the mode of selecting the surgeons to the infirmary which profoundly influenced Bell's whole career. At the instigation of Dr. James

Gregory, Professor of Medicine in the University, the managers introduced a regulation under which six members of the College were elected to act as surgeons to the infirmary for a period of two years at a time. This involved the exclusion of Bell, along with the other younger Fellows, from the staff of the hospital, a disappointment from which he never recovered. An embittered controversy arose which at first divided the whole of the medical profession, but eventually resolved itself into a battle of words between Dr. Gregory and Mr. Bell. In pamphlets, memorials, *Censorian Letters*, and *Historical Memoirs of the Medical War in Edinburgh* Gregory attacked Bell and his party with extraordinary acrimony, and Bell replied in his *Letters on the Education of a Surgeon and the Duties and Qualifications of a Physician, addressed to James Gregory, M.D.*, an octavo volume of over 650 pages of sustained vituperation.

The exclusion of such a man as John Bell from the infirmary staff was a double misfortune: it not only deprived the sick poor of the services of a surgeon of genuine ability and proved skill, but it checked the development of a career which promised to add materially to the reputation of the hospital and of the medical school of Edinburgh. Fortunately, Bell's personal reputation was already secure, and he continued for nearly twenty years

to be looked upon as the leading consulting and operating surgeon in Edinburgh.

No authoritative memoir of John Bell was ever published. His brother Charles prepared notes for a Life, but on consideration it was decided by his family not to go farther, as "it was better to allow his works to speak for him than to excite anew the controversies into which his enthusiasm for his profession had drawn him."[34] This decision, doubtless a wise one when it was made, has withheld from us much of the material necessary for a just estimate of one who played an important part in the development of surgery in Scotland.

Above the average of his contemporaries in mental capacity and general education, by temperament inclined to be contentious, and by bitter experience rendered even quarrelsome, John Bell was little disposed blindly to follow traditional teaching. His acuteness of mind was tempered by a fund of sound common sense, and he had at command a wealth of vigorous and incisive language. These qualities are manifest in his writings, which in boldness and piquancy contrast favourably with the prosy and colourless works of some of his predecessors.

After spending some time amongst the wounded men of Lord Duncan's fleet after the Battle of Camperdown, he wrote his treatise on *Gunshot*

Wounds, which contains evidence of much careful observation and sound deduction. We in our day have had to relearn much that was known to John Bell and has been since forgotten.

"There seems to be a sort of mystery in the business of gunshot wounds," he says, "which arises merely from the singular ideas which the older physicians entertained regarding the nature of shot. Gunshot wounds are made by a blunt round body, which inflicts a deep and dangerous wound, and so bruises the surrounding flesh, that the wound is at first livid, soon becomes black, has little bleeding and no pain, soon falls into actual gangrene, and is extremely difficult to heal."

He is wisely discriminating in the use of the probe in gunshot wounds, and condemns those "who, with a flippant vanity, will introduce their probes among the viscera of the chest or abdomen, where they never should be, for the contemptible desire of exalting their own little character by pronouncing their opinion over a dying man."

Bell deserves credit for the prominent share he took in propounding the "doctrine of the anastomosing arteries," and thereby in limiting the indiscriminate amputation of limbs for gunshot wounds of the main arterial trunks. As an anatomist he had devoted special attention to the investigation of the anastomosing arteries, and he was persuaded that the collateral circulation between

the vessels was sufficient to maintain the vitality of the limb even if the main artery was ligated "close to the point where it comes out from the body." The application of this "doctrine of inosculating arteries" to the problems of wound-healing led Bell to support those who were beginning vaguely to attempt to secure union of wounded tissues without the intervention of suppuration.

"In wounds and operations there are but two great points to be attended to; first, the securing the arteries, so that the patient may be in no danger from bleeding, and then the procuring a speedy adhesion, by which the pain, suppuration, waste of tissue, and all the other bad consequences of the wound are prevented."

To this end he advised the "laying of the wounded parts so cleanly, so neatly, and so evenly in contact with each other that they may adhere. The rest we leave to nature."

This "doctrine of adhesion" was then comparatively new, and like all novelties in surgery gave occasion for much animated discussion, both with regard to its merits and to the question of priority in discovering it. The battle raged chiefly around the question of the flap amputation. The French surgeons who first invented this method of amputating had claimed that by placing the fresh surfaces of the flaps in apposition, adhesion of the flesh had

often occurred, even in three days. To this claim O'Halleran, who continued "to dress the flap and the face of the stump as separate sores till the twelfth day," replied—"with a rudeness and ignorance quite unparalleled," says Bell—"These tales are told with more confidence than veracity. Healing by inosculation, by the first intention, by immediate coalescence without suppuration, is merely chimerical, and opposite to the rules of nature." Gradually, however, through the advocacy of Allanson, Hunter, Benjamin Bell, and John Bell, the doctrine of adhesion gained ground and gradually worked its way into the practice of surgery; even O'Halleran lived to see it adopted as the basis on which both accidental wounds and operations were treated.

The credit of initiating this advance in surgical practice cannot be allocated to any of the numerous claimants to the honour, but John Bell's work on the inosculating arteries contributed to give it a rational basis.

An early but unsuccessful experiment in what would now be called aneurysmorrhaphy is thus described by Bell in his *Principles of Surgery*, with the comment that "our motives for repeating this dangerous operation are very slight indeed."

"I opened the aneurysm, hooked out the clots of blood, and then raised the artery upon my fore-

finger ; I took next a very fine bleeding lancet and scarified the two lips of the wound ; after having made them raw, I passed a very delicate glover's needle through both lips of the wounded artery, and twisted a fine cambric thread round the needle, so as to draw the lips of the wound close. Upon letting go the tourniquet, the artery was seen beating in the bottom of the wound ; the pulse in the wrist became instantly as strong as in the other hand ; indeed, we thought this artery beat rather more powerfully. Everything went on well till the twelfth day, . . . when a dangerous hæmorrhagy came on in the evening. On the fourteenth day the bleeding returned, . . . and the artery was tied with the two ligatures as usual."

A reasoned conservatism is characteristic of Bell's attitude towards many of the surgical problems that in his day occupied the minds of surgeons. Throughout his career he " constantly endeavoured to moderate the rage for operations, and to inspire the young surgeons with a just and rational reliance on the provisions of nature for the cure of wounds and diseases." " Operations," he says in the introduction to his *Principles of Surgery*, " usurp an importance in surgical education which they should not naturally have. Operations have come at last to represent, as it were, the whole science, and the surgeon, far from being valued according to his sense, abilities, and general knowledge, is esteemed excellent only in proportion as he operates with skill."

Respecting neither tradition nor authority, he protested against the prevailing practice of trepanning for every fracture of the skull, whether attended with symptoms or not. Thus, he falls foul of Mr. Pott,

"a surgeon of unrivalled excellence, whose influence was fairly acquired. But let those who have influence with their profession use it discreetly and wisely; let them ponder well the maxims they announce; for Pott fell into a system of practice so bloody and enterprising that, in the few years which have elapsed from his death, it has fallen into utter discredit, and he delivered his maxims in a style so decisive and imperative as to impose even now upon the younger part of the profession, while, by all who judge for themselves, his practice is abandoned. No wonder it is abandoned, being, in every point, except one, repugnant to good principles."

Of M. Quesnow, who, before the French Academy, had advised incision of the cortical substance of the brain in cases of suspected abscess, remarking that he had often observed that the brain substance is insensitive, Bell could not trust himself to speak: "The paragraph is so audacious that in place of translating it in my text, I transcribe it on my margin; there let it stand, like a beacon on a foreign shore." There it stands—not the only beacon from that same shore that has lightened the firmament of surgery.

This is not the only occasion on which we find Bell falling into a fault of which he was prone to accuse others — that of "writing surgery by conjecture and mere guess." Sound as his surgical instincts usually were, when blinded by professional jealousy or personal animosity, failings of which he was by no means free, his judgment was apt to become warped and his language acrimonious. Benjamin Bell, with whom he agreed in nothing save the surname, had recommended that with a view to securing more accurate suturing of divided bowel, the gut might be kept "extended by means of some round body inserted into it." For this purpose he suggested "a small roll of tallow . . . as it will afterwards melt and pass easily with the fæces." In the light of our modern experience of bone bobbins and metal buttons this simple device appears both natural and ingenious, but in John Bell it seems to have raised all the righteous indignation of which he was capable. "If there be in all surgery," he says, "a work of supererogation, it is this operation of sewing up a wounded gut. . . . These observations are unparalleled in all the books of surgery from the invention of printing down to the present day." . . . "It is an untried experiment as yet, and let it be tried when it may, I shall venture to predict that it will turn out a very sad one."

That John Bell was a man who held his surgical

opinions strongly and expressed them forcibly will be evident from the quotations we have so freely made from his writings. Crowded together and condensed as they necessarily are, these extracts are liable to give a wrong impression of Bell's literary style and to exaggerate its acerbity. We cannot correct this better than by quoting at length the description he gives of an operation performed in the Royal Infirmary for aneurysm of the iliac artery,[35] which in human interest and dramatic intensity vies with the famous description of a similar operation performed by Syme in the same hospital more than sixty years later (p. 203).

"A poor man, who was by trade a leech-catcher, fell as he was stepping out of a boat, and the long and pointed scissars which are used in his business being in his pocket, pierced his hip exactly over the place of the sciatic notch, where the great Iliac Artery comes out from the pelvis. The artery was struck with the point of the scissars, it bled furiously, the patient fainted; and in so narrow and deep a wound, the surgeon, when he came, found little difficulty in stopping it up, and less difficulty still in making it heal. The outward wound was cured, the great tumor soon formed; and the man travelled up from the North Country, where the accident had befallen him, and in six weeks after arrived in our hospital here with a prodigious tumor of the hip, his thigh rigidly contracted, the ham bended, the whole leg shrunk, cold, and useless, as if it had been an aneurism

rather of the artery on the fore part of the thigh.

"The tumor was of a prodigious size, and by that very circumstance of its being one of the greatest aneurisms, it lost all the characteristics of aneurism; especially there was no pulsation, no retrocession of the blood when the tumor was pressed upon; there was nothing peculiar except this, that the great and sudden distension was the cause of great pain; and from the continual pain, lameness, and his hopes of a cure, he was ready to submit to anything, beseeching us to operate.

"There was little doubt of its being a great aneurism, but there was a possibility of its being a vast abscess; and it was resolved, in consultation, that he should be carried into the operation-room; that a small incision should be made; that the skin being cut, the bag itself should be just touched with the point of a lancet; and if found to contain matter, should be fully opened; but if blood, that it was then to be considered as an aneurism of so particular a kind, as to entitle us to call for a full consultation.

"I made an incision two inches and a half in length; the great fascia in the hip, blue, and very strong, formed the coat of the tumor, and under that were seen the big fibres of the great Glutaeus Muscle. The knife was struck into it, and large clots of very firm black blood rolled out by the tenseness of the tumor, which began to emit the clots in this way, the moment that it was opened at one point. There was one thing further desirable, before we put the patient to bed, that we should understand the case so far as to be able to report to the consultation, whether the artery was

absolutely open, and whether it was the great artery of the hip. I continued therefore, knowing that the opening I had made could be covered with the point of the thumb, to pull out a few more clots of blood, till the warm and florid blood began to flow; I then pushed in a tent-like compress into the small wound of the tumor (*viz.*, of the fascia), laid a broad compress over the outward wound, and put the patient to bed, with one of the pupils holding his hand upon the hip.

"This was done at one o'clock; at four the consultation met, and the operation was performed. And in my notes, I find two steps of the operation chiefly marked: *First*, That upon our opening the tumor fully with an incision of eight inches long, and turning out the great clots, the blood was thrown out with a whishing noise, and with such impetus, that the assistants were covered with it. In a moment twenty hands were about the tumor, and the bag was filled with sponges, and cloths of all kinds, which had no better effect than the cloths, which, in any accident, the friends in great confusion wrap round a wounded arm; for though the blood was not thrown in a full stream, nor in jets, it was seen rising above the edges of the incision; it floated by the sides of the cloths, which were pressed down by the hands of the assistants. But we knew by a more alarming sign that the artery was throwing out blood; for the man, who was at first lying not flat, but supporting himself on his elbows, fell down, his arms fell lifeless, and without pulse, over the side of the table, his head hung down and his countenance was livid, he uttered two or three heavy groans, and we believed him dead.

"*Secondly*, Seeing in this critical moment that if

he was to be saved, it could be only by a sudden stroke, I ran the bistoury upwards and downwards, and at once made my incision two feet in length: I thrust my hand down to the bottom of the tumor, turned out the great sponge which was over the artery, felt the warm jet of blood, and placed the point of my finger upon the mouth of the artery; then I felt distinctly its pulse, and then only was I assured that the man was still alive. The assistants laid aside the edges of this prodigious bag, and sought out the several smaller sponges which had been thrust in, and the bag being deliberately cleaned, and its edges held aside, I kept the fore finger of my left hand steady upon the artery, passed one of the largest needles round under my forefinger, so as to surround the artery: one of my friends tied the ligature, and then upon lifting the point of my finger, it was distinctly seen, that it was the Posterior Iliac Artery, that the artery had been cut fairly across, and had bled with open mouth—that it was cut and tied exactly where it turns over the bone: and although the extremities were cold, the face of a leaden colour, and the man had ceased to groan, and lay as dead; though the faint pulsation could not be felt through the skin, in any part of the body; we saw the artery beating so strongly, whenever I lifted my finger, that we were assured of our patient's safety. However, he was so low, that after laying down the sides of the sac, and putting bandages round his body to keep all firm, we were obliged to have a bed brought in, and having given him some cordials, we left him to sleep in the great operation-room, attended by the pupils and by nurses.

"He was cured of this great wound in less than seven months."

In a footnote he adds: "Dr. Farquharson, who succeeded me in the charge of the hospital, has just informed me of this man having called upon him, after his return from England, walking stoutly, and in good health."

Through the medium of his writings, Bell's name became favourably known throughout the surgical world, and when he visited the Continent after the peace of 1815 he was most cordially received by members of his profession wherever he went.

He died at Rome on April 15, 1820 (*57*), and there he was buried. On one side of the Celtic cross, erected by the Royal College of Surgeons of Edinburgh in 1891, to mark his resting-place, is the nameless grave of John Keats, identifiable only by his self-appointed epitaph: "Here lies one whose name was written in water." On the other side, Keats's devoted friend and death-bed companion, Joseph Severn, the artist, was buried more than half a century later, after he had lived to see the friend of his youth "numbered among the immortal poets of England."

Of Bell it has been truly said that "he was one of those men who, without apparently achieving great success, leave behind them an abiding impression, and stamp their character in the institutions and thought of the age in which they live."[36]

CHAPTER VII

THE FOUNDATION OF THE CHAIR OF SYSTEMATIC SURGERY

The Teaching of Systematic Surgery in Edinburgh—James Rae—Alexander Monro *secundus*—Professorship of Surgery of the Royal College of Surgeons—Alexander Monro *tertius*—John William Turner—Sir Charles Bell—James Miller.

It might be supposed that the establishment of a Faculty of Medicine within the University in 1726 would have inevitably led ere long to the foundation of a Professorship of Surgery. But many obstacles had to be overcome before this desirable step was taken and the teaching of surgery as an independent subject was placed upon a satisfactory footing. The time was ripe for such an advance, and there were not wanting in Edinburgh surgeons who were able and willing to make it.

The progress which had been made in anatomy and physiology during the seventeenth century had prepared the way for the advances in pathology which marked the eighteenth. The Academy of

Surgery, which was founded in Paris in 1731, under the guidance of such distinguished men as Petit, Desault, and Chopart, set a very high standard alike in scientific and in practical surgery. Under its influence a great impetus was given to original investigation in surgical pathology, and this was reflected in the improvements which resulted in operative procedures.

A natural direction for such pioneer work to take was that of elucidating the reparative processes which accompany the healing of wounds and the cure of diseases. Petit investigated the changes in bloodvessels which bring about the natural arrest of hæmorrhage; John Hunter studied the process of coagulation of the blood and the repair of wounds in general; and Duhamel—a French botanist and engineer, by the way—threw much light on the formation of callus in the repair of fractures by studying the growth of bone in animals after mixing madder with their food.

At the hands of Petit, Desault, Gooch, and Percivall Pott many improvements were made in the treatment of fractures, the last-named surgeon taking advantage of a riding accident which befel him in 1756 to study and describe the fracture of the ankle which is still known as "Pott's fracture," and his book, *Some few Remarks upon Fractures and Dislocations*, despite its modest title, aroused

great interest in Great Britain and France. From his pen also came that description of caries of the vertebræ which in point of lucidity and accuracy left little room for subsequent emendation; as well as contributions on the subject of head injuries and on rupture.

In the field of operative surgery, also, important advances were being made. Cheselden, the friend of Sir Isaac Newton, Alexander Pope, and Sir Hans Sloan, first performed in 1727 his "lateral operation for the stone," based upon that of Rau of Leyden; and he devised a means of improving certain forms of blindness by making an artificial pupil by iridectomy. John Hunter introduced his operation of tying the femoral artery in the thigh for popliteal aneurysm, a procedure which at the time "excited the greatest wonder." Gimbernat began to operate for strangulated femoral hernia; Chopart and Hey of Leeds introduced their operations for partial amputation of the foot; and tentative attempts were made to excise diseased joints by Charles White of Manchester and Henry Park of Liverpool.

The more active spirits among the Edinburgh surgeons had not remained uninfluenced by these progressive movements which were taking place in the great schools in London and on the Continent. To these schools the best of the Edinburgh students

had gone to complete their surgical education, and they had brought back with them fresh ideas and a keen desire to emulate the masters under whom they had studied.

The idea of devoting a complete course of lectures to the exposition of surgery apart from anatomy seems first to have occurred to JAMES RAE, who was Deacon of the Incorporation of Surgeons in 1764. In any case he was the first to put the idea into practice, and for some years he conducted a course privately, with considerable success.

Mr. Rae was descended from a family of long standing as landed proprietors in Stirlingshire. He resided in a house at the head of the old Fleshmarket Close, and obtained much reputation as a dentist, being "among the first (if not the very first) in Edinburgh to rescue that department from the ignorant and unskilful hands in which it was then placed." He also gave private lectures on the diseases of the teeth.[26]

In 1772 he asked the College "to recognize and support a course of lectures on the whole art of Surgery, with practical discourses on the cases of importance as they occurred in the Royal Infirmary." This the College, "being desireous to promote every usefull undertaking towards the advancement of the knowledge of Surgery," readily agreed

to do, and they not only recommended their students to attend the course, but resolved to communicate to Mr. Rae such cases of importance as might occur in their practices. Rae may therefore be looked upon as the founder of the practice of teaching surgery clinically in Edinburgh.

The success which attended this early venture in the systematic and practical teaching of surgery was so encouraging that in 1776 the College approached the magistrates with a view to having a Professorship of Surgery established within the University. This proposal was vigorously opposed by Alexander Monro *secundus*, who by this time had succeeded his father in the Chair of Anatomy, and who represented to the magistrates that although it was not expressed in his commission, "the teaching of surgery has been universally understood to belong to his office," which was constituted "on the plan of the most celebrated University of Leyden."[6] In reply to this contention the College urged that as their Charter, granted by King William and Queen Mary, gave them the exclusive right of operation both on living and on dead bodies, any nomination of a Professor of Surgery should be made from their Society, and as Monro was neither a member of the College of Surgeons nor a practical surgeon, they maintained that it was not in the interests of their

art that the teaching of the subject should be in his hands, to be carried out as a subsidiary part of his course of anatomy.

These pleas seemed sound both in law and in reason, but the combined influence of the Monros and the University prevented the petition of the surgeons being granted, and the ultimate outcome of a bitter controversy was that, in 1777, Monro received a new commission appointing him Professor of Medicine, and "particularly of Anatomy and Surgery."

Thus did vested interests stand in the way of progress; and although the name of Alexander Monro *secundus* stands at the head of the official list of Professors of Surgery in the University, it cannot be claimed that he did anything directly to advance the art which he professed.

He was among the leading Scottish physicians of his own time and one of the great anatomists of all time, and the celebrity he attained throughout the scientific world did much to enhance the rising reputation of the Edinburgh School, of which he was the acknowledged head for many years. "Monro was a man of middle stature, vigorous and athletic, with a large head and a countenance expressive of intelligence, solidity, and humour. Busy as he was, he enjoyed society, in which his anecdotal powers shone; he was an enthusiastic

admirer of the theatre ; and he took great pleasure in cultivating his garden and in planting and ornamenting the estate of Craiglockhart, which his success in his profession had enabled him to purchase in 1779."[7] He held the Chair of Anatomy for fifty-four years, and died in 1817 at the age of eighty-four.

In 1804 the College of Surgeons, having failed in their endeavours to persuade the Town Council to establish a separate Chair of Surgery in the University, decided to institute under their own ægis a Lectureship on the Principles and Practice of Surgery. It was stipulated that the course should be given annually, that it should be of the same duration as the courses of the Professors of Medicine in the University, and that officers of the medical staff of the army, and surgeons and surgeons' mates in the navy, should be admitted to the lectures gratis. John Thomson was appointed the first lecturer, with the title of "Professor of Surgery of the Royal College of Surgeons." The University, through the Town Council, opposed the establishment of a Professorship outside its own walls, on the ground that it would interfere with one of the classes taught within the University, but they did not push their objection, and Thomson was duly installed in his office. Thus it came about that a Professorship devoted entirely to

surgery was founded in the Extra-mural School twenty-seven years before the teaching of surgery was separated from that of anatomy within the University.[42]

Two years later Thomson was appointed by the Crown Professor of Military Surgery in the University, but he continued, by permission of the College, to perform the duties of the Professor of Surgery. In 1821, Thomson resigned his College appointment, and was succeeded by Mr. J. W. Turner (p. 84), who had for two years been recognized by the College as his assistant. When he resigned in 1831, on becoming Professor of Surgery in the University, he was succeeded by John Lizars (p. 127), who held the post for eight years. On receiving his resignation, the College decided to discontinue the Professorship, in view of the fact that their long-cherished desire that a Chair of Surgery should be established within the University had now become an accomplished fact.

Alexander Monro *tertius* succeeded his father in the anatomical Chair in 1798, and while he engaged in practice as a physician, he continued to deliver the few lectures that constituted the official course of surgical instruction given in the University.

Although he "lacked neither ability nor accomplishments," Monro was by universal consent "far

from being a popular lecturer." "In all he did and said his manner betrayed an unimpassioned indifference, as if it were all the same to him whether his teaching was acceptable or not."[37] "He was so insufferably careless and lazy that it is said he absolutely forgot the elements of the subject he professed to teach. . . . He used to read his grandfather's lectures written about a century before"; and even the shower of peas with which the expectant students greeted his annual reference —"when I was a student in Leyden in 1719" failed to induce him to alter the dates.[38]

Under such conditions it is little wonder that the students filled the class-rooms of the extra-mural teachers, and the need for a complete course of surgery within the University was more clamantly felt than ever.

It was not until 1831, however, after the Monros had monopolized the University teaching of surgery for 110 years, that the Crown, on the recommendation of the Town Council, established a separate Chair of Systematic Surgery and appointed John William Turner the first incumbent.

John William Turner
(1790-1836)

The action of the Crown in erecting the systematic Chair seems to have come upon the surgical

JOHN THOMSON, M.D., F.R.S.E.
Professor of Surgery to the Royal College of Surgeons, and Professor of Military Surgery in the University of Edinburgh.

(From a mezzotint by T. Hodgetts, after A. Geddes, in the Collection of the Royal College of Physicians of Edinburgh.)

WILLIAM JOHN TURNER
Professor of Surgery.

(From a painting in the Surgical Museum, University of Edinburgh. Lent by Professor Alexis Thomson.)

world of Edinburgh as something of a surprise, for even the College of Surgeons, who had fought for it so long, first learned that their object had been attained when their own Professor of Surgery, Mr. J. W. Turner, intimated to them that he had been offered the University Chair, and had accepted it.

Born in England, Turner received his medical education in Edinburgh, and after making a voyage to India as surgeon to an Indiaman served for some time as assistant-surgeon of militia and as medical officer of artillery at Leith Fort.

He then became assistant to Dr. John Thomson, with whom he formed a life-long friendship. Along with Thomson, he took an active share in founding the New Town Dispensary, and in 1821 he succeeded his master as Professor of Surgery of the Royal College of Surgeons. He did a great deal to develop the museum of the College while he acted as conservator, and was chiefly responsible for the compilation of the first printed catalogue of the collection.

His work was frequently interrupted by illness, and for the benefit of his health he went to Paris as private medical attendant to Lord Holland, and in a similar capacity spent a summer in the Highlands of Scotland with the Duke of Bedford.

In 1829 (*39*), his health restored, he was appointed one of the surgeons to the Royal Infirmary, and

two years later he entered upon the duties of the newly-created Professorship. His tenure of the Chair was short, for in 1836 (*46*) he died after an acute illness contracted in the course of his infirmary duties, as a result of exposure on a wet night. He was buried at Newbattle, where he had spent his early years.

Mr. Turner "was a most uninteresting lecturer; a timid, shy man, who could not look his class in the face, and seemed fitted by nature for anything rather than the duties and responsibilities of an operating surgeon."[39]

He left little save a few papers in the medical journals from which we may judge his position as a surgical writer. As a man he was highly esteemed, and "his conduct towards his professional brethren was marked by the most delicate attention to their feelings."

Sir Charles Bell
(1774-1842)

The Edinburgh School can only lay claim to a modest share of the glory reflected from the great name of Charles Bell. His epoch-making investigations on the structure and functions of the nervous system were made while he lived in London, and it is on his discoveries in physiology rather than on his contributions to surgery that his fame rests.

It was in the Extra-mural School in Edinburgh, however, that his attention was first directed to the study of the nerves, and "even before he left Edinburgh a suspicion had grown upon his mind that the prevalent opinion regarding the functions of the peripheral nerves was erroneous." At that time he was acting as assistant in the anatomical rooms of his elder brother, John (p. 60), who was then engaged on his *Anatomy of the Human Body*. Charles's passion for drawing (inherited from his mother) found ample scope in the preparation of the illustrations for this work, particularly of the volume devoted to the nervous system and special senses. He had already, while still a student in 1798 (*24*), published a *System of Dissections*, illustrated by his own drawings, and the artistic excellence of these works had brought him under the favourable notice of the profession both at home and abroad. His election to the Fellowship of the Royal College of Surgeons of Edinburgh, in 1799 (*25*), entitled him to act as one of the attendant surgeons to the Royal Infirmary, and the prospect of a successful career in surgery seemed to open out before him. The following year, however, new rules for regulating the attendance of the surgeons at the infirmary came into force, and along with others—including his brother John—he was excluded from the privilege of acting on the surgical staff. There seems

little doubt that this restriction of his opportunities for acquiring clinical experience, and his natural repugnance to engage in the heated controversies which arose from the change, influenced his decision to try his fortunes in London. Thither he went in 1804 (*30*), and, not without a struggle, made for himself a reputation in the world of science which "put him beside Harvey."

In 1836 (*62*) he returned to Edinburgh as Professor of Surgery, an office to which he was invested "with the unanimous assent and acclamation" of the electing body—the Town Council. "And surely," wrote his brother George, "never was an offer more honourable to an individual, for I do assure you it has the approbation of all ranks and classes of men, and of none more than the Professors of the University and the whole medical profession." In spite of the great scientific reputation he had earned by his genius, and the high social position to which he had attained, Bell does not seem ever to have been quite at home in London, and such reward as comes in the form of an extensive consulting practice had not been his. Yet he left the scenes of his life-work with genuine regret, and with a sense of "pain of resigning all here which has hitherto been my pride."

The professional considerations which led to his acceptance of the Chair of Surgery appear in his

correspondence with his brother George: "It has ever been my pride to join the pursuits of science (and lecturing is of all conditions the most conducive to scientific pursuits) and practice. In surgery they cannot safely be separated. . . . I could imagine many happy circumstances in a life devoted to the University. . . . The place of a Professor who *fills his place* is the most respectable in life. My hands are better for operation than any I have seen at work; but an operating surgeon's life has no equivalent reward in this world, and some from coarseness, want of feeling, and stupidity, deserve in the next . . . ! I must be the teacher and consulting surgeon to be happy."

In a letter to John Richardson he says: "I had hoped . . . to accomplish a great work on anatomy, a design which was innermost at my heart when coming here."

Less definitely avowed but perhaps not less potent motives appear to have been a vague sense of failing health, "the hope of an easy professorial life, love for George,* and ready access to the beautiful country around Edinburgh."

The high expectations with which he entered on his new sphere of activity do not seem to have been

* His brother, the author of Bell's *Commentaries of the Laws of Scotland*, still one of the standard textbooks on Scots law.

fully realized. Nor was it likely in a man of Bell's temperament, torn at the age of sixty-two from an environment in which he had lived and worked for thirty-two years, that he would take root kindly in new surroundings. When he had made the choice he himself said, "I have been *dislocated*, and I feel it."

He was most kindly received in Edinburgh, and acquired a not inconsiderable practice among the nobility of Scotland—an association which for Bell had the added advantage that it "let him have free access to their streams," and so enabled him to indulge to the full his passion for fishing and his love of the country.

Some years before his return to Edinburgh (1825) the museum he had collected at the Windmill Street School of Anatomy was secured by the Royal College of Surgeons of Edinburgh, and is now incorporated in their collection, together with a series of water-colour drawings of gunshot wounds made at Brussels after the Battle of Waterloo, when he was engaged as a surgeon with the British troops.

Of his surgical work in Edinburgh there is not much to be said. He performed the routine duties of the Chair with such meticulous care that before the examination for degrees—which then included an examination in Latin—we find him every morn-

ing reading diligently at his old school-books— "an unambitious, dreamy use of time that gives perfect rest." George Wilson records that he found him "a most gentlemanly, kind examinator," who gave him "a few questions regarding the diseases for which legs are cut off."[40]

In 1838 (*64*) he published his *Institutes of Surgery*, and in 1841 (*67*) a volume of *Practical Essays*, but these works do not contain any contributions to surgical knowledge which add to the reputation he had already made by his works on the nervous system.

"His dexterity and coolness as an operator were remarkable; yet he went to operations with the reluctance of one who has to face an unavoidable evil, in this respect resembling Hunter and many other first-rate surgeons. Like Cheselden, who is said always to have turned pale when about to cut for the stone, Bell's cheek was often seen to blanch on proceeding to operations performed with the utmost self-possession and skill."[41]

His letters written after he settled in Edinburgh contain frequent references to the unsatisfactory state of his health, and within a year of his return he was "full of forebodings."

During the spring vacation of 1842 (*68*), he set out on a visit to London, and on April 27 had got as far as Hallow Park, near Worcester. That evening

he walked in the churchyard, and while sketching an old yew-tree remarked to his wife: "This is a sweet spot; here I fain would rest till they come to take me away." During the night he was seized with an attack of angina pectoris, and died. "They laid him to rest in the peaceful churchyard, not far from the yew-tree."

James Miller
(1812-1864)

The next professor of systematic surgery, and the last of the pre-Listerian period, was James Miller. Like so many of his Scottish compeers, Miller was a son of the manse. His father, the Rev. James Miller, was minister of the parish of Eassie in Forfarshire, where his third and namesake son was born on April 2, 1812.

Before commencing his purely medical studies in Edinburgh, Miller spent three years at the University of St. Andrews, where he came under the influence of Dr. Thomas Chalmers, the great Scottish divine, whose lead he followed in 1843 when the Free Church parted with the Established Church at the Disruption.

Early in his student career Miller became a pupil of Robert Liston, and one of his most enthusiastic admirers. By nature the two men would not appear to have had many affinities, yet they formed

a strong and lasting friendship. For the last five years Liston was in Edinburgh Miller acted as his private assistant, sharing not only in his operative work, but also, it is said, in his literary labours, particularly in the preparation of his *Elements of Surgery*. When Liston went to London in 1834, he was anxious that Miller should accompany him, but the prospect of obtaining the vacant assistant-surgeonship in the Royal Infirmary, as well as other considerations, determined him to try his fortune in Edinburgh. His hopes regarding the infirmary post were realized, and he succeeded to the greater part of Liston's private practice.

In 1842 Miller became a candidate for the Professorship of Surgery, rendered vacant by the death of Sir Charles Bell, and after a keen contest with Dr. Argyll Robertson and John Lizars was elected at the early age of thirty. As events proved, the selection of the Town Council, who were then the patrons of the Chair, was abundantly justified, for it was as a teacher and lecturer that Miller was at his best. Handsome in person, with an extraordinary fluency of diction, punctuated by appropriate gesture, he ranked amongst the orators of his day, and secured the interested attention of his students even when the subject-matter was least attractive. His lectures were aptly illustrated by telling anecdotes, and illumined by flashes of wit.

Although as an operator he was bold and dexterous, excelling particularly in the performance of lithotomy (then the crucial test of manipulative skill) and in other operations on the urinary organs and on the rectum, he was singularly conservative in the use of the knife. In tuberculous affections, for example, he relied much more than the majority of his contemporaries on treatment by constitutional measures, and in some directions he anticipated the practice of our own day.

His most important contribution to surgical literature was his *Principles and Practice of Surgery*, in two volumes, which went through four editions, and was recast in a fifth as a *System of Surgery* shortly before his death. He contributed the article "Surgery" in the then current issue of the *Encyclopædia Britannica*, and published many papers on professional and social subjects. His literary style was fluent, if somewhat diffuse, and showed a distinct partiality for "apt alliteration's artful aid."

Professor Miller took a prominent part in social and Church work in Edinburgh, and was an enthusiastic supporter of the temperance movement. For many years he acted as Professor of Pictorial Anatomy to the Royal Academy, and at the time of his death he was Surgeon to the Queen in Scotland.

While still at the height of his power as a teacher, and enjoying an extensive practice, which was not confined to surgery, his health rapidly gave way, and he died at Pinkhill near Edinburgh on June 17, 1864, at the age of fifty-two, having held the Chair of Surgery for twenty-two years.

CHAPTER VIII

THE CHAIR OF CLINICAL SURGERY

The Chair of Clinical Surgery—Foundation of the Chair—First Professor, James Russell—Position in the Royal Infirmary—Friendship with Sir Walter Scott—His Surgical Writings.

THE premier surgical Chair in Edinburgh is that of Clinical Surgery. It was erected in 1803 by King George III., who endowed it with a stipend of fifty pounds a year. It thus ante-dates the foundation of a separate Chair of Systematic Surgery by twenty-eight years. Bedside instruction had been given in the Royal Infirmary ever since its foundation, and the practical teaching in the hands of the acting surgeons had reached a high standard of efficiency. For some reason which it is difficult to explain, when the subject of clinical surgery received academic recognition, the Professor who was selected to fill the chair—James Russell—ceased to be an acting surgeon, and only enjoyed the doubtful privilege of lecturing on the patients under the care of others. Nor were the students

required to attend the class. This unsatisfactory state of affairs was remedied when Syme succeeded Russell; the managers allocated a number of beds to the clinical Professor, and the Senatus made attendance on the lectures compulsory for graduation.

James Russell
(1755-1836)

The first incumbent of the clinical Chair was James Russell, a leading member of the Incorporation of Surgeons, who had for a number of years before he was appointed Professor taught clinical surgery to large classes in the Extra-mural School.

Through several generations his family had been associated with the surgeons: his grandfather was elected a member of the surgeon-barbers in 1721, the year before the crafts were separated; his father was president of the surgeon-apothecaries in 1752, but relinquished his lancets and pestles to take up the mantle of Adam Fergusson as Professor of Natural Philosophy in Edinburgh University in 1764. James Russell joined the Incorporation in 1777 (*22*), and became President in 1796 (*41*).

Russell was one of the six surgeons selected by the managers of the Royal Infirmary in 1800, when the agreement of 1738, that all the members of the Incorporation of Surgeons should be privileged to

act on the staff, was abrogated. Much against his will, for he is reputed to have been a man "singularly free from the jealousies and painful rivalries of his contemporaries," he was thus dragged into the bitter controversy which arose between the managers and the Incorporation at this time. It does not appear that any serious objection was raised, either on personal or professional grounds, to Russell, or indeed to any of the selected six, but the Incorporation looked upon the action of the managers as a breach of a solemn engagement which could only be terminated by agreement between the parties. The personal factor in the dispute arose from the fact that some of the most brilliant of the younger surgeons, including the brothers John and Charles Bell, were excluded from serving on the infirmary staff, and surgical careers of exceptional promise were thus summarily nipped in the bud.

The advent of Mr. Russell to his surgical charge was the occasion of a stormy scene. At the appointed hour he arrived to take over the patients from his predecessor, Mr. Flanagan, but the latter was not present. After waiting for half an hour Mr. Russell commenced his duties, but no sooner had he done so than Mr. Flanagan, accompanied by John and Charles Bell and a number of other surgeons and students, came in and angrily upbraided him before the students and nurses for

what he considered an act of discourtesy in not awaiting his arrival. So animated did the discussion become that the managers found it necessary to send a peremptory message requesting the visitors to withdraw and leave the consulting-room "to the acting surgeons, for whom it is intended"; and they further resolved that "if any member of the College of Surgeons should hereafter be guilty of such unwarrantable conduct he should be deprived of the privilege of access to the hospital."[42, 43] It must be said that in no sense was Mr. Russell the aggressor on this occasion, and that throughout he behaved with calmness and dignity. The incident is scarcely worth recalling except to illustrate the feeling which the action of the managers aroused amongst the surgeons at the time.

Mr. Russell's popularity with his fellows was in no degree diminished, and when he was selected by the Crown to fill the newly created Chair of Clinical Surgery in the University, his appointment on personal grounds met with their cordial approval. The establishment of a Surgical Chair, and the selection of one of their number to fill it, were objects for which the College had long struggled, and now their hopes had been fulfilled. But the College had not been consulted in the matter, and the action of the Crown appeared to them to infringe what they considered their immemorial

privilege of teaching as well as practising surgery within the city. A protest was therefore framed to safeguard their rights, but it does not seem to have gone farther than a pigeon-hole in the office of the Lord Chief Baron, to whom it was sent, "not as an official paper, but merely to show the views of the College."

By an arrangement which was singularly inconducive to his success as a teacher, when he was appointed Professor, Russell ceased to be an acting surgeon to the infirmary. "He received, however, the appointment of permanent consulting surgeon, in which capacity he regularly accompanied the attending surgeons in their visits, was cognizant, therefore, of everything going on in their wards, and, moreover, was in some measure answerable for all acts of surgical interference which required to be authorized by a consultation. Having thus no hospital cases of his own, Russell nevertheless undertook, and by the acting surgeons was allowed, to discharge the delicate duty of lecturing on the cases of others. In such a method, criticism, of course, is impossible. Mistakes cannot be acknowledged. Better methods cannot be suggested. Even commentary must often tread on tender ground, unless it consist entirely of approval, or at least of assent. Thus the student will be led to suppose that surgery is a sure and easy-going art,

which either always attains its object, or, if not, fails through no fault of its own or of the surgeon. Russell, however, piloted his way skilfully among these quicksands, and gave much useful information to well-attended classes."[37] It is hard to conceive of such a plan working smoothly, even with the exercise of the most consummate tact on the part of the Professor, and we are not astonished when a contemporary writer tells us that while Russell "lectured at large on the cases of the ordinary surgeons, making remarks on their treatment, they, especially Mr. Liston, made remarks on him."

"The Professor was a tall thin gentleman of the old school, who wore a red wig, was always dressed in black, with a white neck-cloth—not a tie, but a choker of the 'Beau Brummell' style (perhaps that exquisite might have condemned it as 'a failure'). He indulged in a broad frill on his shirt-breast. The tailed coat was then the ordinary morning coat, so that was nothing conspicuous; but he considered it essential to maintain the style of knee-breeches, silk stockings, and shoes, though the muscular development of his lower limbs at that time hardly warranted its continuance. He lectured at 4 p.m. in a small room opening into the consulting-room, from a sort of pulpit, the benches immediately surrounding which were

seldom crowded, owing to the retiring character of the students of that period; and, although he was most polite in pointing out the vacant spaces to those he saw standing near the door, the same unfortunate modesty prevented them availing themselves of the kindly meant invitation. With all his peculiarities, we rather venerate the memory of the old gentleman, for such he emphatically was."[64] This recollection of an old pupil may be supplemented by another: "But I must say he was a somnolent lecturer, a quality which was fomented by an evening class-hour, and betrayed by an inveterate habit the Professor had of yawning while he spoke, and continuing to speak while he yawned."[73]

Among his intimate friends Russell counted Sir Walter Scott, in whose *Journal*[44] are to be found the following entries: *Dec.* 5, 1825: "Supped at Dr. Russell's usual party, which shall serve for one while." *Dec.* 3, 1827: "We supped at Dr. Russell's, where the conversation was as gay as usual." *March* 3, 1828: "At Royal Society. Also went after the Society to Dr. Russell's symposium."

A footnote to one of these entries explains that "of the many Edinburgh suppers of this period commemorated by Lord Cockburn, not the least pleasant were the friendly gatherings in 30, Aber-

cromby Place, the town house of Dr. James Russell, Professor of Clinical Surgery. They were given fortnightly after the meetings of the Royal Society during the session."

After acting as Professor for thirty years, and "by his own exertions securing for the teaching of clinical surgery its rightful place in the curriculum of surgical study," Russell relinquished the Chair in 1833. Although he had reached the age of eighty-one and suffered from many of the frailties which accompany such advanced years—including, doubtless, the old man's sense of being indispensable—Russell made it a condition of his resigning that his successor should pay him the sum of £300 a year for the period of his lifetime. James Syme was elected his successor, subject to this condition (p. 191).

Syme's strongest opponent for the Chair was Robert Liston, who "positively, and in rather coarse terms,"[46] refused to agree to pay this retiring allowance. The circumstances of the transfer gave rise to an acrimonious discussion in the medical Press, and afforded Robert Knox, the anatomist, an opportunity of exhibiting that caustic rhetoric of which he was such a master. In a pamphlet[45] he attacked what he called "the most complete of all jobs"—the "selling" of the Chair of Clinical Surgery, and its "purchase" by "a person who,

though possessing very respectable talents as a surgeon and merit as a lecturer, ought to have been allowed to grow a little older before being placed in so responsible a situation." The matter in itself was not so serious as Knox would have us believe, and the transaction was in every respect open, fair, and honourable. In its consequences it certainly belied all his predictions, for the advent and career of James Syme added to the reputation of the Edinburgh School of Surgery a lustre that will never fade.

Russell died three years after his retirement, at the age of eighty-four.

His contributions to the literature of surgery were of no outstanding merit, but his published works show that he was a painstaking and accurate observer, although not a profound thinker.

At the Royal Society of Edinburgh in 1803 (*48*) he contributed a paper on "A new and hitherto undescribed Variety of Hernia"—what is now known as the "direct" form of inguinal hernia. It is interesting to note that he inclined to the modern opinion that this is to be looked upon as a form of ventral rather than of inguinal hernia.[73]

His *Practical Essay on a Certain Disease of the Bones termed Necrosis* (Edinburgh, 1794) (*39*) constitutes one of the first attempts to give a complete and detailed description of what must have been a

common surgical affection. It has the merit of being original, and is evidently based upon a considerable experience of the disease at the bedside and an exhaustive study of the available pathological material. He brings out the interesting fact that although the condition was known to Albucasis, who flourished in Arabia towards the close of the eleventh century, it was not till 600 years later that Scultetus described a typical case of it, and that even such comparatively modern surgeons as Cheselden, Gooch of Norwich, and William Hunter were but imperfectly acquainted with the nature and course of the disease. Russell's own study is of value chiefly for the full and systematic description he gives of the clinical course of the disease both in its acute and chronic phases. What he has to say on the causation of necrosis is summed up in four short sentences, the gist of which is that it seems "to be connected with that state of the constitution which depends upon the age of the patient, . . . and it more readily attacks those who have a scrophulous taint in their constitution." On the perennial question of the rôle of the periosteum in forming new bone, Russell held a definite opinion. "To me it seems proved," he says, "almost to a demonstration, that the original periosteum has no share whatever in the formation of the new bone." It must be confessed that his

proof is far from convincing, and he has no more satisfactory explanation of the formation of the new case to offer than that "the pulpy mass which extends from one portion of the bone to the other, and is itself at last converted into bone, is entirely a new creation, and has no dependence upon the original bone or its periosteum." Almost inevitably he invokes the intervention of that blessed thing called "inflammation," and unconsciously gropes towards the modern doctrine of artificial hyperæmia when he says: "It would doubtless be most convenient to possess the means of calling for so useful an effort of nature, . . . but as yet this is an expectation which we cannot indulge with confidence." Yet the first line of treatment he suggests in the early stages is the application of "emollient poultices and warm fomentations." How often do we write prose without knowing it!

Further evidence of Russell's powers as a clinical observer is to be found in his *Treatise on the Morbid Affections of the Knee Joint* (1802) (*47*), which contains a remarkably clear and comprehensive account of the clinical aspects of "white swelling," in striking contrast to the involved and inconclusive discussion of the treatment of the condition in which it is difficult to trace any guiding principle. The symptomatology of "moveable bodies" in the joint is also well described, and the treatment logically

criticized. He doubted the prudence of attempting to remove them, especially when pedunculated, by excision. "Indeed, every case in which I have known the experiment tried has terminated unfavourably; I can, therefore, with more confidence condemn the practice as rash and injudicious." A special chapter is devoted to the description of an "uncommon disease" of the knee, of which Russell had seen four or five cases, which in the light of our modern knowledge appears to have been myeloma of the head of the tibia.

The last of his published works, *Observations on the Testicles*, is also the best. It was issued the year he resigned the Clinical Chair (1833), and was dedicated to the President and Fellows of the Royal College of Surgeons, in acknowledgment of his obligation to the College "for the patronage afforded to the Class of Clinical Surgery, and for the facilities and support granted me to promote the success of the undertaking." It differs from his previous works in that he freely quotes the experiences and opinions of other surgeons, and culls many quaint and curious records from remote sources. In style it is vastly superior to its precursors, and is a work which may still be read with profit as well as pleasure.

CHAPTER IX

THE CHAIR OF MILITARY SURGERY

Foundation—John Thomson, the First Professor—Surgeon to Royal Infirmary—Professor of Surgery of the Royal College of Surgeons—His Surgical Writings—Professor of Pathology—Sir George Ballingall, the Second Professor—Contributions to Military Surgery—Abolition of the Chair.

King George III., who founded the Clinical Chair in 1803, three years later extended his patronage by erecting a Chair of Military Surgery, and endowing it with a salary of one hundred pounds a year.

The need for such an institution was first pointed out by John Bell, whose experiences amongst the wounded sailors after the Battle of Camperdown moved him to address a memoir[47] to Earl Spencer, then First Lord of the Admiralty, pleading for the establishment of "one great school of Military Surgery," and sketching a plan on which it might be organized. Of this memoir, which admittedly paved the way for the foundation of the Chair, Sir George Ballingall has said: "With some enthusiasm in the language, perhaps I may say some extrava-

gance of expression, it breathes throughout a spirit of patriotism and a feeling of sympathy with the wounded seamen worthy of all admiration."[48] Had action been taken promptly, the choice of the Crown would doubtless have fallen on Bell, but after the lapse of several years Dr. John Thomson was nominated as the first incumbent of the Chair.

John Thomson
(1765-1846)

John Thomson was born at Paisley in 1765, and at the age of eleven was bound apprentice to his father as a silk-weaver for seven years (p. 84). In such spare time as he could find he educated himself in the hope that circumstances might some day enable him to enter the profession of medicine, on which he had set his heart. By the time his "seven long years were out" he had acquired a considerable knowledge of botany, natural history, and chemistry, and with the aid of a friendly teacher had mastered something more than the elements of the Latin language. The doubts of his father having at length been removed, he abandoned the weaver craft and was apprenticed to Dr. White of Paisley, who, recognizing the talents of the lad, took great pains in directing his studies. In 1788 Thomson entered the University of Glasgow, and a year later migrated to Edinburgh, where he completed his

course. Thereafter he visited other schools and spent some time in London.

As a pupil of Sir Everard Home, the disciple as well as the brother-in-law of John Hunter, Thomson early came under the spell of the Hunters, and this connection did much to influence in more ways than one the lines on which his career was subsequently developed. To it may be traced his solid grounding in the principles of pathology which formed the basis of his surgical teaching, and ultimately landed him in the Chair of Pathology. He has been bracketed with John Abernethy and Astley Cooper as among the chief expounders of the Hunterian doctrines; "it is probably not going too far to say that to the veneration in which these three distinguished men held the opinions and example of John Hunter, and to their constant references to him in their lectures, the propagation of his doctrines and their influence on English surgery has been mainly owing."[49]

On his joining the College of Surgeons in 1793 (*28*), Thomson became eligible to act on the surgical staff of the Royal Infirmary, and as he was one of the six surgeons selected by the managers in 1800, his clinical opportunities as an operator and teacher were not interrupted, as were those of so many of his contemporaries, by the new régime.

When the Professorship of Surgery of the Royal

College of Surgeons was founded in 1804, Thomson was selected as the first Professor (*39*).

In 1806, when the Whigs came into office with the Grenville party, the Chair of Military Surgery was founded in the University, and Thomson, who was "a combative prominent Whig, and at one time somewhat more than a Whig,"[37] was appointed the first Professor (*41*). He continued, however, to act as the Professor of the College of Surgeons till 1819, when, on the ground that the stress of work involved in the dual Professorship was interfering with his health, he requested the College to recognize Mr. J. W. Turner as his assistant in conducting the operative part of his course. This request was granted, but two years later he resigned the College Professorship, after having held it for seventeen years, and Mr. Turner was elected in his place. Thomson's success as a lecturer may be judged by the fact that in 1815-1816 as many as 250 to 280 pupils attended the course.

Thomson held the Military Chair for sixteen years, but it cannot be said that his success was commensurate with his talents and opportunities. The fact is, he was not bred a military surgeon, and he did not know at first hand the conditions of work in the field in time of war or even in barracks in time of peace. According to Ballingall, his successor in

the Chair, who had it on "the best of all authority" —namely, from Dr. Thomson's own lips—"a main object which he had in view in connecting the Professorship of Military Surgery with his other office, was the more complete and effective teaching of surgery within the University. . . . By this arrangement the course of military surgery was conducted during the whole of the Peninsular War in conjunction with, or as an appendage to, a more extended course of lectures."

The only record we find of his experience in actual warfare is contained in a *Report of Observations made in the British Military Hospitals in Belgium after the Battle of Waterloo*, which he made to His Royal Highness the Duke of York, Commander-in-Chief, in 1816 (*51*).

"Upon hearing of the result of the Battle of Waterloo," he says, "I immediately resolved to proceed to Belgium, that I might have an opportunity of observing the medical and surgical condition of the men who had been wounded in that battle." He left London, accompanied by Dr. Somerville, Principal Medical Officer in Scotland, on the 4th, and arrived in Brussels on the 8th of July, and was afforded every facility for observing the wounded in the hospitals at Brussels, Antwerp, and Termonde. In addition to studying the treatment and progress of the wounded, he made a

series of sketches, which he subsequently presented to his successor in the chair.

In 1822 (*57*) he resigned the Professorship of Military Surgery, and after failing to secure the Chair of Medicine, rendered vacant by the death of Gregory, he applied himself to the study of pathological anatomy.

In 1831 (*66*) the Crown instituted a Chair of Pathology in the University, and issued a commission nominating Thomson the first Professor.

This was the third Professorship in Edinburgh that Thomson had been the first to fill, which led Robert Knox to refer to him as "the old chair-maker."[50] This tendency to fill Scottish Chairs, if not to make them, he appears to have transmitted to his sons, for William became Professor of the Practice of Physic in the University of Glasgow, and Allen successively held the Chairs of Anatomy, at Aberdeen, Institutes of Medicine, at Edinburgh, and Anatomy, at Glasgow.

It was while he was Professor of Pathology that Thomson made one of his most valuable discoveries. Among the graduation theses submitted to him in 1832 was one on "Death from Inflammation," bearing the name James Young Simpson, and so impressed was he by its merits that he invited the writer to become his assistant at a salary of £50 a year, "and hence," says Simpson, "I came to

settle down—a citizen of Edinburgh." Simpson took up obstetrics as his speciality on the recommendation of Thomson, and in after years spoke of him as one "to whose advice and guidance I owed a boundless debt of gratitude."[51]

Thomson held the Chair of Pathology till 1842, and died in 1846 (*81*).

The best known of Thomson's surgical writings is his *Lectures on Inflammation, Exhibiting a View of the General Doctrines, Pathological and Practical, of Medical Surgery* (Edinburgh, 1813) (*48*). As if to justify the term "medical surgery" on his title-page, he begins with an essay on the reciprocal relationship between medicine and surgery, with the object of combating the growing tendency of his day once more to separate the two arts in practice as well as in education. His historical sketch of the evolution of the healing art shows wide research, and is of permanent value. For the rest, the work is an exposition of John Hunter's views on inflammation and inflammatory diseases, and manifests a wide acquaintance with the literature of the subject rather than an extensive practical experience. It has a merit which Hunter's own writings sadly lacked of being clear, consecutive, and comprehensible.

His *Report of Observations made in the British Military Hospitals in Belgium after the Battle of*

Waterloo (Edinburgh, 1816) (*51*) is chiefly of value for the Appendix, "Some Remarks upon Amputation," which contains a complete history of the operation from the earliest times, the result of extensive literary research. Thomson's writings on *Varioloid* and *Small Pox*, on which his reputation as a clinical observer chiefly rests, and his *Biography of William Cullen*,[52] do not concern us here.

Sir George Ballingall
(1786-1855)

When Dr. Thomson resigned the Chair of Military Surgery, three candidates were nominated to the Secretary of State as his successor. Two were put forward by the College of Surgeons: Dr. David Maclagan, "an active and eloquent citizen who made himself useful in many public positions in Edinburgh," and who had seen much active service as a physician to the forces in the Peninsular War. Not the least of his public utilities was the family of gifted sons he left to adorn high positions in the medical profession and in the Church. One became Archbishop of York, another was the beloved Sir Douglas, the Professor of Medical Jurisprudence in Edinburgh till 1897, and others served the State in the army and in civil practice. Dr. Maclagan had the distinction, which was shared

by his son, Sir Douglas, of being elected President of both the Royal Colleges in Edinburgh.

The other member of the surgeons proposed was George Ballingall, who began his career in the army as surgeon to the 33rd Regiment of Foot, afterwards the 1st Royals, and subsequently was in the Duke of Kent's regiment. He saw service in India and in other parts of the East, and was present with the army in Paris in 1815.

The third candidate, Dr. Borthwick, was not a member of the College, and received his nomination by family influence through the Town Council.

The choice of the Crown fell upon Ballingall, and he was installed in the Chair in 1822 (*36*).

The task before him was not an easy one. His predecessor had never taken the subject of Military Surgery quite seriously, and his conduct of the Chair had rather encouraged the idea that the course should consist merely of a series of lectures on the subject of gunshot wounds. No lecture room or museum had been assigned to the class within the University. Moreover, the times were times of peace, and the country, heartily tired of war, was turning its attention to the reconstructions and economies which a long and expensive campaign had rendered necessary.

His experience in India, at Prince of Wales Island, at Java, and with the army in France, had

convinced Ballingall of the need for a complete course of instruction, not only on the injuries incident to warfare, but also on the diseases to which European troops are specially liable abroad, and on the general hygiene of camps. He had found the gentlemen educating for the East India Company's service and those serving with Her Majesty's regiments in India in special need of such instruction, and it was uphill work to persuade those in authority of the importance of reform. After many disappointments, he received the aid and encouragement of the East India Company to the extent that they required candidates for their service to attend a course of military surgery. In 1829 the Royal College of Surgeons of Edinburgh revised their regulations so as to permit of candidates for their diploma taking a course of military surgery in lieu of one of the two courses of surgery prescribed. This action of the College was speedily followed by a corresponding movement on the part of the heads of the medical departments of the Navy, the Army, and the Ordnance giving the same option to candidates for their respective branches of the service. In response to the persevering efforts of Ballingall, strongly supported by the *Lancet*, the Secretary of War included in the army estimates for 1854 a vote of £400 for the

endowment of additional Professorships of Military Surgery in London and in Dublin.

Into the work of his own Chair he threw himself with equal ardour, and for over thirty years he maintained a high standard of efficiency in teaching his subject. His *Outlines of Military Surgery*, which ran through four editions, contained the substance of his lectures, and, in addition to much historical matter, furnished a lucid exposition of the principles and practice of military surgery based on a sound knowledge of the general surgery of his day. As surgeon to the Royal Infirmary he was kept in touch with clinical work, and a selection of the lectures he delivered in association with the Professor of Clinical Surgery shows him to have been a shrewd observer and a graphic teacher. He was the first to suggest the administration of chloroform as an aid to the detection of feigned and fictitious diseases.

His *Practical Observations on the Diseases of the European Troops in India* (Edinburgh, 1823) (*37*) was highly esteemed in its day. Another result of his activities in India may still be seen, in the museum of the College of Surgeons, in the form of the skeleton of an elephant, which he prepared and presented to his former master, Dr. Barclay, the anatomist, of whom he wrote a short biography prefixed to his *Introductory Lectures* (1827).

Ballingall received the honour of knighthood on the occasion of the accession of King William IV. in 1830 (*44*). He has been described by a contemporary as a man of "bright face, well-set figure, and military bearing," who was "unselfish and ready to help younger men," and who "had the esteem of all his professional brethren, and was generally popular."

He died suddenly at Altamont near Blairgowrie in December, 1855, at the age of sixty-nine.

Before a successor was appointed, Mr. Syme addressed a letter to Lord Panmure, then Secretary of State for War, pointing out that the circumstances under which the Chair of Military Surgery was founded in 1806 had entirely altered—notably by the establishment of the Chair of Systematic Surgery in the University, which provided for the teaching of the purely surgical aspects of the army doctor's work. He submitted that the proper duty of a Military Professor should be to explain "the arrangement of hospitals, the position of camps, the effects of diet and exposure, the admission of recruits, the invaliding of soldiers, the management of wounded men, the keeping of records, the diseases of climates and seasons, with their prevention and remedy, and all the other peculiarities of a military and naval life, in health as well as in sickness," and that these duties could only be

efficiently performed in a large military hospital by actual demonstration. He advised the abolition of the Chair as "a useless incumbrance." His suggestion was acted upon, and the Chair of Military Surgery was abolished in 1856.[46]

CHAPTER X

SOME SURGEONS OF THE EXTRA-MURAL SCHOOL

The Extra-mural School: Its Origin, Growth, and Influence — Clinical Teaching — Extra-mural Surgeons — John Lizars—William Fergusson—Richard John Mackenzie.

In tracing the growth of the Edinburgh Medical School it has been shown that not only did it take its origin in the ancient craft of barber-surgeons, but that for nearly two centuries and a quarter it was carried on under the ægis of the Incorporation of Surgeons and the College of Physicians by teachers who had no official connection with the University. It was not until 1726 that the Faculty of Medicine had what the historian of the University, Principal Sir Alexander Grant,[53] called "its quasi-fortuitous beginning" by incorporating as Professors a number of the "private lecturers." Those who were not thus drawn within the walls of the University continued to conduct their classes as extra-academical or extra-mural lecturers in a rivalry more or less friendly to the Professors,

This dual grouping of teachers has ever since been one of the characteristic features of the School. "One of its greatest advantages," says Grant, "has been that the University has continued to be surrounded by extra-mural rivals, who have kept its Professors up to the mark, and sometimes eclipsed them, and who have always been in training to fill up the ranks of the University whenever vacancies occurred."

In another direction the extra-mural teachers have played an important part in guiding the destinies of the medical school. Free from the bonds of statutes and ordinances, they have always been able to lead the way in developing instruction in special branches of knowledge, and many of the specialities that are now represented within the University originated in the Extra-mural School. Special courses of instruction were given by extra-mural lecturers in Mental Diseases, Neurology, Diseases of the Ear, Throat, and Nose, Dermatology, Diseases of Children, Applied Anatomy, Operative Surgery, and Tropical Diseases for many years before lectureships in these subjects were founded in the University.

At first the teaching was carried on in private premises or within the precincts of the College, but as the number of students increased, and more teachers entered the lists, the lecturers banded

themselves together in groups and conducted a number of classes in co-operation, each group occupying a separate building. Thus there arose a number of rival schools within the School—"Surgeons' Square," "Argyll Square," "Brown Square," "Minto House," and in more recent days "Park Place" and "The New School"—each with its band of lecturers and its loyal following of students.

When the Royal Infirmary was founded the managers "resolved to spare no pains in cherishing the medical school, as far as the hospital could serve that purpose; and, foreseeing that its interest would soon be interwoven with that of the University, they resolved to adopt every measure that could tend to facilitate medical education and to render it complete. They therefore permitted all students, upon paying a small gratuity, to attend the hospital that they might have all the benefit that could be derived from the practice of the physicians and surgeons."[21]

The clinical teaching as conducted in the infirmary by the Professors and certain other members of the honorary staff outside the University is described by Arnot[15] as "in some measure peculiar to itself." In wards set apart for the purpose, under Professors in the University, or other physicians and surgeons sufficiently qualified

for the office, "the most minute attention is paid to every circumstance of the disease, . . . and every industrious student keeps a journal for himself of the reports taken daily from the mouth of the physician, in which are accurately related all the effects resulting from the use of medicine . . . ; they have, further, the advantage of hearing the grounds of this practice afterwards fully illustrated and explained in lectures." In the surgical wards certain of the "dressers" were told off for the purpose of bleeding patients, and to assist the "visiting cupper of the hospital." These wore blue checked aprons "with a pocket and sleeves," in contrast to the white linen aprons worn by the surgeons. Among the duties of the surgeons was "to attend to the instruction of the dressers; to improve them as far as possible in accurate, neat, and even elegant dressing; to examine their reports from time to time, and to subscribe in the register their approbation or dislike of the reports every week."[21] For long only the senior acting surgeon had the right, along with the Professor, of delivering clinical lectures, but gradually the privilege was extended until all the surgeons enjoyed it.

The importance of the Extra-mural School as a factor in medical education was recognized by the Town Council, who, as the patrons of the University, in 1842 issued statutes allowing University

students to take a certain number of their classes with the extra-mural teachers. To this proposal the Senatus demurred, and appealed to the Courts for support, but the point was finally settled against them by the House of Lords in 1847. This concession had the effect of increasing the number of extra-mural teachers, and among those who were thus stimulated to take to lecturing was Mr. Lister, described in the medical Press of the day as "a former clerk of Mr. Syme's and said to be a protégé of that distinguished surgeon."[65] In 1895 the Extra-mural School was reorganized and consolidated as "The School of Medicine of the Royal Colleges." The privilege of attending the extra-mural teachers has gradually been extended, until now one-half of the classes required for University graduation may be taken in the School.

The fears of the Senatus that the opening up of the extra-mural classes to University students would militate against the interests of the University proved groundless. On the contrary, both sections of the medical school received benefit. The most distinguished periods in the history of the Medical Faculty have always coincided with the periods during which the teaching power of the Extra-mural School was at its highest. It would be idle to speculate as to which body has set the standard, but to each the efforts of the other acted

as a stimulus to maintain a standard which neither alone would have reached. Where one has been weak, the other has supplied the defect, and the healthy rivalry between the two has invariably been beneficial to both. The Extra-mural School has ever remembered that its success depends on the prosperity of the University; the University has sometimes forgotten how much of its reputation it owes to the Extra-mural School. From its ranks the Professoriate has been largely recruited, and many of the names that have made the University of Edinburgh famous were transferred from the lists of extra-mural teachers. In surgery these include the first Monro, J. W. Turner, John Thomson, Sir George Ballingall, Sir Charles Bell, James Miller, James Russell, James Syme, and Joseph Lister, and the other departments of medicine have been no less worthily represented.

The fame of the Edinburgh Medical School was never higher than in the fifty years preceding the opening of the Listerian era, and to the surgeons of the Extra-mural School of that period—Robert Liston, John Lizars, William Fergusson, Richard J. Mackenzie, and James Syme—it owed no small share of its reputation.

John Lizars
(1794-1860)

Although the name of John Lizars[29] is less familiar now than that of most of his contemporaries, in his own day he attained to considerable prominence, as much perhaps from his friendly association with such great men as John Bell, William Fergusson, and Robert Liston—and, be it said, from his life-long antagonism to an even greater, James Syme —than from his own surgical achievements, notable as these were.

Following the Edinburgh tradition, Lizars entered surgery through the portals of anatomy. These were the halcyon days of the "private lecturers" on anatomy in Edinburgh. The teaching of the subject within the University under the third Monro left much to be desired, and the students, who were numerous, were driven to seek instruction elsewhere. In the Extra-mural School they had ample choice of accomplished teachers: William Cullen (grand-nephew of the great Dr. Cullen), elegant, painstaking, and abreast of the times—"he gave some special lectures on the stethoscope, then new in Edinburgh";[7] John Aitken, who combined the teaching of physiology with anatomy and surgery; and, greatest of all, that tragic personality, Robert Knox, whose profound

knowledge of morphology "invested the subject of human anatomy with a new interest," and whose "wonderful command of the most powerful and felicitous language," combined with wealth of caustic rhetoric, rendered his lectures most attractive. Lizars was not wanting in confidence when he entered into competition with such rivals, but his courage was justified, for his class-roll showed an average attendance of about 150 students.

When in 1826 the practice of dissection was made compulsory on all candidates for degrees, the difficulty of obtaining sufficient anatomical material to meet the demands of something approaching a thousand students threw a serious responsibility on the teachers. The straits to which they were driven need not be dwelt upon here. The story of the evil traffic which led to the desecration of the local churchyards, and worse, forms the most sordid episode in the annals of the Edinburgh Medical School, but it only touches indirectly on the history of the surgical school, and on that plea may be passed from.

The scarcity of subjects for dissection forced certain teachers to fall back upon the use of pictures to illustrate their lectures and demonstrations. In so far as they relied upon the admirable series of engravings which had been produced under the guidance of the Monros, the Bells, Fyfe,

Gordon, Barclay, and Knox, this practice was all to the good, but it was otherwise when they covered the walls of their class-rooms with crudely drawn and brightly coloured diagrams, "a kind of mural art, neither natural nor æsthetic . . . huge misrepresentations of nature," as Knox disdainfully called them.[50]

Lizars was one of the worst offenders in this respect, and he has been described as a draughtsman-anatomist, who favoured alphabetic mnemonics and puerilities of learning, and dealt uncommonly in gaudy colours and big pictures"[50]—a type of teacher unfortunately not yet extinct.

His aim, however, was to become an operating surgeon, and he gave up the teaching of anatomy and began to lecture on surgery alone. When Mr. Turner resigned the Professorship in the College of Surgeons in 1831, Lizars contested the vacancy against Syme, and, thanks to the influence of Liston and Fergusson, was elected, but only by the narrow majority of one vote. Syme could afford to lose the appointment, his position as a surgeon and a teacher being already well assured, but to be beaten by Lizars was a sore blow to his pride. Between the two there arose a bitter animosity, which cropped up repeatedly in after years. Lizars has been described as "a Nimrod famous for 'going at anything,' but frequently

coming off his horse involuntarily." This was usually his fate when he engaged in his favourite sport of "going at" Syme. On one occasion he had to pay costs and damages awarded by a jury "for false and calumnious statements" relative to Syme's practice. Later he had to withdraw his work on *Practical Surgery* in order to expunge a similar statement. In the protracted controversy regarding the merits of Syme's operation of external urethrotomy time has given the verdict against Lizars.

The breach between the two was never healed, but by a curious stroke of irony it was Syme who left on record the highest testimony we have to the surgical foresight and acumen of Lizars. Speaking, in 1865, on the operation of ovariotomy, Syme disclaimed for Edinburgh such "honour of priority" as attached to its having first been performed there, and to emphasize his derision of the originator of the operation he added: "It was brought forward by the same person who had proposed to remedy hypertrophy of the heart by blowing air into the pericardium, to puncture the brain in acute hydrocephalus, and to treat enlargement of the prostate by cutting out the entire gland." This person was John Lizars.

He resigned his appointment of Professor of Surgery to the College in 1839, and the opportunity was taken to abolish the Chair.

Lizars is said to have been "bold and fearless, almost reckless, as an operator," but "his knowledge of after-treatment was scarcely equal to his operative dexterity." His most famous operation was the ligation of the innominate artery for aneurysm, which he carried out for the first time in Scotland, with the assistance of Fergusson, in 1837 (*43*).[69]

He was the first in this country to perform ovariotomy, and a reviewer of his *Observations on Extraction of Diseased Ovaria*[74] considers his record of two successful cases out of four very satisfactory.

In 1826 he published[75] a report of the first operation of removal of the maxilla for sarcoma performed in Scotland. In addition to a series of *Anatomical Plates* he published a *System of Practical Surgery*, which was highly thought of in its day, and as appendices descriptions of the *Operation for the Cure of Squinting*, and *Operation for the Cure of Club-foot*. His *Practical Observations on the Treatment of Stricture of the Urethra and Fistula in Perineo* (Edinburgh, 1851) (*57*) is an elaborate attack on Mr. Syme's operation of external urethrotomy, and is only interesting as an example of the surgical polemics of the times.

Lizars died of cerebral hæmorrhage on May 21, 1860, at the age of seventy-four.

Sir William Fergusson, Bart.
(1808-1877)

"I have great pride in considering myself of the Edinburgh School." This was said by Sir William Fergusson when, after more than a quarter of a century of strenuous work in London, he stood at the head of his profession in the metropolis, unrivalled as an operator and revered as a man. Edinburgh reciprocated the compliment, for she had always felt a peculiar pride in Fergusson's brilliant career. His enduring contributions to the progress of surgery were mostly made while he was in London, but they shed on the Edinburgh School a glory that was not entirely reflected, for their inception could usually be traced to the dissecting-rooms of Knox at Surgeons' Hall, or to the operating-theatre of Liston, Lizars, and Syme in the old Royal Infirmary.

A native of Prestonpans, East Lothian, educated at the High School of Edinburgh, Fergusson entered the University originally with the object of following the law, but life in a lawyer's office did not prove congenial, and he soon fell in with his father's desire that he should study medicine. At the age of seventeen he became a pupil of Robert Knox, then at the height of his fame as a teacher of anatomy. Knox was not long in recog-

SIR WILLIAM FERGUSSON, BART.

(From a mezzotint by F. Joubert (1874), after R. Lehmann, in the Author's Collection.)

nizing the capacities of his young pupil, and, inspired and encouraged by his master, Fergusson soon developed a genuine enthusiasm for anatomy. His days, and often his nights, were spent in the dissecting-rooms, and before he was twenty he was acting as Knox's demonstrator. "Tall, lithe, handsome, with an animated, cheery countenance, a bright eye, and manly bearing," he shared in the remarkable popularity of his chief as a teacher. Unfortunately, he could not escape sharing also in the opprobrium which at that time attached to Knox, and indeed to all who were responsible for providing the material for dissection. In this matter, however, Fergusson's record is clear, for, while he did not lack zeal in maintaining the supply of subjects, there is nothing to show that he even suspected the awful sources from which some of them came. If he profited by his association with Knox, he also suffered, but he never winced, and when dark days came to his master he proved his faithful friend and generous helper.

In the infirmary he was fascinated by the manual dexterity of Liston, Lizars, and Syme, and he deliberately set himself to emulate their manipulative skill. He cultivated his natural aptitude for mechanics by making such instruments and appliances as he required, and he greatly pleased Knox by presenting him with a complete dissecting-case

made and furnished by his own hands. To train himself in the use of his scalpel he laboriously made those wonderful dissections of the bloodvessels of the hand, foot, and head which are still amongst the most treasured preparations in the museum of the Royal College of Surgeons of Edinburgh. It is said that he even practised the violin, less to gratify his love of music than to gain the delicacy and accuracy of touch demanded by that instrument.

A new departure in the teaching of anatomy was initiated in Knox's rooms in 1829, when Fergusson began his course of demonstrations on "Surgical Anatomy," an aspect of anatomical study which specially appealed to him, and which he was in the habit of tracing to the introduction of the Hunterian operation for aneurysm. He made special dissections of the different surgical regions of the body to illustrate the operations most frequently performed in those days, and these he demonstrated to small sections of the class seated round a table. It is difficult to imagine a more perfect means of arousing in the student an intelligent interest in practical anatomy and of concentrating his attention on essentials.

In 1829 (*21*) Fergusson was admitted a Fellow of the Royal College of Surgeons of Edinburgh, and two years later he became surgeon to the

Royal Dispensary. Here he found opportunities of practising his art, and amongst other operations of importance he tied the subclavian artery, an operation that had then been done only twice before in Scotland, once by Wishart and once by Liston. Gradually his increasing practice and hospital duties compelled him to abandon to a great extent his work in the dissecting-rooms.

In 1839 (*31*) he was appointed surgeon to the Royal Infirmary in succession to Liston, and there he obtained a wider scope for operative work. In 1840 a vacancy occurred in the Chair of Surgery at King's College, London, and, on the advice of Sir Astley Cooper, Fergusson was invited to fill it. The main consideration that induced him to migrate from Edinburgh was undoubtedly the fact that the Chair carried with it the surgeoncy to the hospital, and as the tenure of his appointment in the Royal Infirmary was only for five years, with a possible extension of two years more, he foresaw that he would have to relinquish his hospital work just when he was becoming most useful. His departure from Edinburgh was a cause of sincere regret, for it was universally recognized that the School was losing one of its most distinguished members.

Fergusson could not expect to escape the traditional period of struggle that awaits the young

Scot who seeks professional fortune in London, but circumstances conspired to lighten it for him. Within a few years of his arrival, Astley Cooper, Callaway, Aston Key, and Robert Liston passed from the scene, and other surgeons of note retired from practice. A fair field was thus opened for him, and his professional skill, no less than his personal qualities, enabled him to take full advantage of his opportunities. He was elected an Honorary Fellow of the Royal College of Surgeons in 1844 (*36*). It is told that his appointment to the post of Surgeon-in-Ordinary to H.R.H. the Prince Consort, in 1849, came about in this way. Sir James Clark was consulted with reference to the claims of several surgeons of distinction whose qualifications were under discussion, when the Prince clinched the matter by saying, "Well, Clark, the question is—Supposing I had to have my leg amputated, who is the best man to do it?" "Why, Fergusson, by all means," said Sir James. "Then," replied the Prince, "he shall be my surgeon." In 1855 (*47*) he was appointed Surgeon-Extraordinary, and, in 1867 (*59*), Sergeant-Surgeon to the Queen. The previous year a baronetcy had been conferred on him "in consideration of distinguished merit and eminence as a surgeon."

His appearance at his prime—"commanding and dignified in person and bearing, with handsome

features and a large dark eye, soft and benevolent in its expression"—is preserved for us in the portrait painted by Rudolph Lehmann, and reproduced in mezzotint by F. Joubert. He died from Bright's disease on February 10, 1877 (*69*), in London, and was buried at West Linton, near his beloved Scottish home at Spittlehaugh.

No small part of Fergusson's reputation rests on his remarkable dexterity as an operator. Deliberate yet rapid, concentrated on his object, and avoiding all display in accomplishing it, every step in proper order and carried out in silence, the impression left on the mind of the spectators was that even the most difficult and complicated operation was perfectly simple and easy of execution. All contemporary evidence goes to show that, after the death of Liston, he was unrivalled as an operator in London. It is sufficient testimony that Sir James Paget, in his famous Hunterian oration delivered the day before Fergusson was carried from London to be laid at rest in his native Scotland, spoke of him as "the great master of the art, the greatest practical surgeon of our time." In his operations he employed few instruments, and these were of the simplest. Some, devised by himself, are still in everyday use, and have made his name familiar to succeeding generations of students. Fergusson's lion forceps, his angled bone pliers, his mouth gag,

and his cleft-palate knives and needles are amongst the most purpose-like implements in the surgical armamentarium. Others, like his lithotrite and certain kinds of specula, formed the models on which the modern patterns that have superseded them were designed.

As a teacher he impressed his pupils more by his example than by his precepts. Reticent and wanting in fluency, it has been said that he failed to impart the results of his vast experience and knowledge.[70]

Fergusson's contributions to the advance of surgery were many and varied, if not strikingly original or revolutionary. To priority of invention he seldom laid claim—indeed, he was singularly generous in acknowledging what he owed to his predecessors as well as to his contemporaries—but he is entitled to the credit of introducing many improvements in operative technique that have stood the test of time. His attention was early directed to the congenital deformities of the mouth, his first formal operation, performed while he was still a demonstrator with Knox, being for hare-lip. About the same time he had an opportunity of studying by dissection the muscular apparatus in a case of cleft palate, which led him to improve upon the classical operation of Roux by dividing the levator-palati and palato-pharyngeus muscles before bring-

ing together the edges of the soft palate. The improvement in the results which followed this procedure at once led to its general adoption, and Fergusson himself was able to claim 129 successes out of 134 cases operated upon. For this particular operation he did not use an anæsthetic, as he considered it "absolutely requisite to have the patient conscious, so that he may facilitate the steps in a variety of ways." Although he excelled in the performance of lithotomy—the crucial test of surgical dexterity in those days—he was a strong advocate of the crushing operation, and the ingenious form of lithotrite he devised did much to simplify this operation and to make it popular.

"Thanks to the skill, labour, judgment, and forcible example of the Professor of Clinical Surgery in the University of Edinburgh, excision of the elbow-joint has now become 'a great fact' in surgery," said Fergusson in 1867, and the revival of excision of joints for disease, initiated by Syme, had no more enthusiastic supporter than Fergusson. His advocacy of "conservative surgery"—it was he who coined the term—did much to impress upon his surgical contemporaries the possibilities of saving useful limbs by excision, and so avoiding the "opprobrium of surgery" which lay in amputation.

The improvements he effected in operations on

the jaws, particularly for malignant disease, have become the standard procedures of to-day.

In the last of the lectures he delivered before the Royal College of Surgeons of England in 1865,[54] Fergusson lifted the veil and revealed to us some of the secret sources which made him the surgeon that he was. It is too full of good things to stand condensing, and might serve as the articles of faith of all aspiring surgeons.

Richard James Mackenzie
(1821-1854)

Although he died at the early age of thirty-three, a variety of circumstances combined to secure for the name of Richard James Mackenzie a place all its own in the annals of the Edinburgh School of Surgery.[76] His singularly attractive personality, his accomplished work as a surgeon and the promise it warranted of still greater attainments, and the tragic circumstances of his death in the service of his country, called forth the affection and admiration of his contemporaries, and have passed into a tradition among his successors.

From his boyhood he had set his heart upon being a doctor, and when he left the Edinburgh Academy at the age of seventeen, his father bound him apprentice to Dr. Adam Hunter, under whose tutelage he derived all the benefits inherent to the

apprenticeship system of medical education. His natural leaning towards surgery was confirmed and the direction of his future career determined when he became resident-clerk in the Royal Infirmary under Professor Syme.

Early in the forties he obtained his diploma as a surgeon, and graduated in medicine, his inaugural thesis being entitled *Practical Observations on Injuries of the Head.* Two years were then spent in visiting the medical schools in London and on the Continent. He studied in the surgical clinics at Hamburg, Berlin, and Vienna, but the work of Velpeau, Malgaigne, and Roux in Paris appears to have attracted him most.

On his return to Edinburgh in 1844 (*23*) he became a Fellow of the Royal College of Surgeons, and after being for four years in practice, he was elected an assistant surgeon to the Royal Infirmary. The following winter he began to lecture on systematic surgery in the Extra-mural School at Surgeons' Hall, and a year later had the good fortune to be promoted acting-surgeon to the Infirmary at the early age of twenty-nine. He made the best possible use of his exceptional opportunities, and by dint of hard work in the course of less than five years made for himself a position in the School and a reputation among the public such as had seldom been attained by one of his years.

It was a fortunate circumstance that Mackenzie entered upon his surgical career as a pupil of James Syme, for the bent of his mind rendered him peculiarly susceptible to the influence of such a master. He was essentially "practical" in his outlook on surgery, and "he had a clear head, and abounded in that common sense which seems to form so large and necessary an element in the character of a surgeon." Although capable of thinking for himself, and not wanting in originality, his published writings show to what an extent his interests and his practice were influenced by his association with Syme. His surgical career was not a long one, but, as Liston has said, "years are not the measure of experience," and the record of surgical work which Mackenzie left behind him makes up in quality for what it may lack in volume. It reflects the current views on various questions which at the time bulked largely in the surgical mind.

His first published paper was the report of a successful operation for ligation of the subclavian artery for hæmorrhage from the axillary, and he made various other contributions on the surgery of the bloodvessels. The great controversy with regard to the merits of Syme's operation of external urethrotomy was raging in Mackenzie's day, and he took part in it on the side of Syme. The first

patient on whom he performed the operation died of pyæmia, but this had no effect in shaking his confidence in the merits of the operation, which he repeatedly performed with satisfactory results. Like his master, whose methods he followed, he was remarkably successful in plastic operations for the restoration of the lips, nose, and cheeks, as the illustrations which accompany his papers abundantly demonstrate.

In 1853 (*32*) he published an important paper on excision of the knee-joint, an operation which had long fallen into disuse, but was then being revived. Mackenzie was deeply interested in this subject, and went so far as to travel to the island of Jersey to see some of the series of fifteen cases operated upon by Mr. Jones there, with success in fourteen —a remarkable record in these days. Early in the sixties a London surgeon, Mr. Price, assistant to Sir William Fergusson, collected the records of 250 cases, which showed the same mortality as in amputation of the thigh, and it was seriously debated which operation was likely to have the higher mortality, the majority inclining to the belief that excision would prove the more fatal.

His most important contribution to surgical practice, however, was the modification of Syme's amputation at the ankle by an internal flap, which came to be known as "Mackenzie's amputation."

It consists in cutting a flap from the inner aspect of the foot, and he did not propose it as a substitute for Syme's operation, "in the majority of cases the preferable proceeding," but as one which is available to avoid amputation in the leg, when the condition of the soft parts precludes the possibility of forming a heel-flap.

The crisis of Mackenzie's life came in 1854. News came through that surgeons with hospital experience were wanted by our army in the Crimea, and he offered his services. His friends realized the risks he was taking, but he himself was either blind or oblivious to them, and in the best of health and spirits set out on May 13 for Turkey, where he arrived on June 6. The Earl of Aberdeen, then Prime Minister, brought him under the notice of Lord Raglan, who posted him to the Cameron Highlanders (the old 79th), where he found a number of his Edinburgh friends. The next three months proved a wearisome period of inaction for the regiment, but the medical officers, unfortunately, were not left idle, for while they were stationed at Gervehler a serious epidemic of cholera broke out and taxed their energies to the utmost. Mackenzie had not gone to the East to treat cholera, but when the call came to him he threw himself into the work with such whole-hearted devotion as to "gain golden opinions of everyone."

On September 3 orders at last came for the regiment to embark for the Crimea, and on the 20th they took part in the Battle of the Alma. Mackenzie was present throughout the action, and was amongst the first on the field to render assistance. His letters reveal the profound impression the sufferings of the wounded made upon his sensitive nature. "What a sight!" he writes; ". . . this morning it floored me when I went over the field, the ground strewed with the ghastly dead and wounded. I could not stand it, and went off to the rendezvous where the wounded were brought." There he worked from morning till night until he was "exhausted with sheer hard work."

The regiment had a trying march as they moved on towards Sebastopol, and on September 24 they encamped at Bornoo. That night Mackenzie was seized with Asiatic cholera, and the next morning he died. Within an hour after his burial "the mighty host moved on," leaving behind them one who was described by a brother-officer as the "best-hearted, least selfish man I ever met—as a Christian, as near perfection as possible."

CHAPTER XI

THE PERIOD OF LISTON AND SYME

Robert Liston—Lecturer on Anatomy—Exclusion from the Royal Infirmary—Famous Operations—Surgeon to Royal Infirmary — Contributions to Surgery — Quarrel with Syme — Reconciliation — Removal to London — First Operation under Ether Anæsthesia in England.

Towards the close of the pre-Listerian era the Surgical School of Edinburgh reached the zenith of its fame. In a band of able and accomplished surgeons two figures stood out pre-eminent: Robert Liston, the great operator, and James Syme, the surgeon *par excellence*.

Robert Liston
(1794-1847)

"A tall man, powerful in form, dressed in dark bottle-green coat with velvet collar, double-breasted shawl vest, grey trousers, and Wellington boots, the thumb of one hand stuck in the armhole of his vest, comes along in an easy-going way, chewing an orange-wood tooth-pick."[66] This was Robert

ROBERT LISTON

(*From a mezzotint by J. C. Bromley, after F. Grant, in the Author's Collection.*)

Liston, the boldest and most dexterous operator of his day: the "Great Northern Anatomist" of the *Noctes Ambrosianæ*. A son of the manse, he was born at Ecclesmachen in Linlithgowshire on October 28, 1794. His father, the Rev. Henry Liston, minister of the parish and a leader in the Courts of the Church of Scotland, acquired a certain celebrity in his day as a writer on music, and exercised a natural bent for mechanics by inventing, in addition to an enharmonic church organ that gave the diatonic scale in perfect tune, an improved form of plough, which proved more useful to his parishioners.[29, 59, 60]

In 1810 (*16*) Robert Liston entered upon the study of medicine in Edinburgh by becoming a pupil of John Barclay, an anatomist of exceptional culture, "distinguished not only for his Greek, mathematics, and Hebrew, but also for his candour, good humour, and kindliness." After spending ten years as a preacher in the Church of Scotland, Barclay took to medicine, and at the end of a highly successful undergraduate career boxed the compass by dedicating his graduation thesis to Dr. James Gregory *and* Mr. John Bell (p. 63).

Liston's ambition was to become an operating surgeon, and to this end, under the guidance of Barclay, he devoted himself whole-heartedly to the study of anatomy. His surgical studies were

pursued in the Edinburgh Royal Infirmary, at the London Hospital under Blizard, and at St. Bartholomew's under Abernethy. In 1818 (*24*) he obtained the membership of the Royal College of Surgeons of Edinburgh, and about the same time he became a member of the London College.

For a time he was one of the band of brilliant demonstrators whom Barclay had gathered round him, and in this capacity he acquired a high reputation amongst the students both as a teacher of anatomy and as a surgeon. In consequence, it is said, of a misunderstanding with his master, he decided to become a lecturer on anatomy and surgery on his own account. A class-room was secured and the venture was launched in the winter session 1818-1819, with a class of sixty students and with James Syme as his demonstrator and assistant. To obtain material for dissection was his chief difficulty. The meagre supply available in Edinburgh was already controlled by the experienced "agents" of Monro and Barclay, with whom it was not easy to enter into competition. "It was no uncommon occurrence," Christison tells us, "for one party to have a lookout man sitting on the churchyard wall in the dangerous dusk, ready to drop down on the first appearance of the rival party and appropriate the grave by striding across it."[37] Another grim method of staking out a claim

was to drive a digger into the sod of the coveted grave. It would appear, however, that the rights thus established were not always respected, and curious tales, many of them doubtless apocryphal, are told of the part played by Liston and his friends in some of these nocturnal escapades. On one occasion, it is said, the emissaries of Barclay successfully contested with him the rights to a claim with the aid of pistols.

By fair means or by foul, however, the needs of the students were sufficiently met, and for five years Liston and Syme between them carried on the class with ever-increasing success. But the teaching of anatomy was not the career that these two ambitious youths had planned for themselves, and in course of time the claims of the dissecting-room had to take second place to the calls of the hospital. While he acted as surgeon's clerk under Mr. George Bell and Dr. Gillespie in the Royal Infirmary, Liston seized every opportunity of acquiring clinical and operative experience, and after his period of office had expired he continued to follow the surgical practice of the hospital, not only during the visits of the staff, but also in the evenings, which he spent with his friend Syme when he in turn became surgeon's clerk under Mr. William Newbigging.

It can well be imagined that these evening

meetings in the residents' room afforded two such enthusiastic young men, each endowed with a natural genius for surgery and fired with the ambition to excel in it, ample opportunity not only of discussing the various clinical problems raised by the cases in the wards, but also of criticizing the efforts of their seniors to deal with them. It must be confessed that the standard of surgery in the infirmary at this particular period was not high, and the practice of some at least of the visiting staff left room for criticism. Liston and Syme would not have been house-surgeons if they had not detected the joints in the armour of their chiefs; neither would they have been themselves if they had not pierced them with truer thrusts than are at the command of the majority of their kind.

The reputation that Liston had made as a teacher of surgery at Surgeons' Square followed him to the hospital. From the first he manifested that boldness of initiative and dexterity in execution for which he later became famous. His ability as an operator was quickly recognized, and in the absence of serious opposition from the senior members of the staff he soon acquired a very considerable practice as an operating surgeon. His success in cases in which others had failed to give relief, or had even refused to make the

attempt, spread his reputation throughout the district, and his services were eagerly sought by the most seriously afflicted of the sick poor. As he had no official connection with the infirmary he had to operate in the homes of the patients or in lodgings which he provided for them, and to rely upon the friends of the patients for such nursing as they were capable of. Under these unfavourable conditions, with the assistance of Syme, Liston performed many operations that have since become historical, and that laid the foundation of advances in operative surgery of far-reaching import.

Liston's seniors could not but view with some misgivings the rise of such a serious rival, and in some at least his growing reputation aroused a feeling which can with justice be called by no softer word than jealousy. Sinister rumours began to circulate that Liston was abusing his privileges as he "walked the hospital," and that the patients who formed his clientele were induced to forsake the infirmary by undue influence. He was accused also, and not without reason, of openly criticizing the surgical practice of the hospital in such a way as to diminish its reputation in the eyes of the public. The matter culminated in the managers of the Infirmary passing the following resolution:[55]

"EDINBURGH,
"14*th March*, 1822.

"The Managers have made such inquiries as satisfy them, that Mr. Liston has frequently been guilty of interfering improperly in the surgical department of the House, and with the patients. They therefore consider it to be their bounden duty to take such measures as may prevent Mr. Liston, and deter others, from pursuing similar conduct in future; and therefore Resolve, that Mr. Liston be prohibited and discharged from entering the wards or operation-room of the Royal Infirmary, at any time, and on any pretence whatever; and he is hereby prohibited and discharged accordingly. And they direct their clerk forthwith to transmit a copy of this resolution to Mr. Liston, and the Treasurer to notify the substance of it to the Physicians, Surgeons, Apothecary, Matron, Clerks, and Porter."

This drastic step was taken without any formal charge being made against Mr. Liston, and without his being given any opportunity of meeting the innuendo contained in the resolution. The action of the managers was confirmed by the Court of Contributors under the influence of a powerful indictment made against Liston by the then Lord President of the Court of Session, and the leading advocate of the day, Francis Jeffrey. The learned judge and counsel spoke from a brief which was notoriously one-sided as to the facts and singularly biassed by personal animosity, but

against such a weight of forensic skill and ingenuity Liston was helpless, and the resolution of the managers became operative.

Liston appealed to the College of Surgeons for support on the ground that the action of the managers in excluding from the infirmary one of their members without their concurrence was an infringement of one of the ancient rights of the College. His petition, however, met with a cold reception, the President (one of the surgeons to the infirmary) curtly replying that "under all the circumstances of the case the Royal College of Surgeons do not consider it expedient or necessary to take any steps in consequence of the communication from the managers of the Royal Infirmary."

Liston's public defence took the form of an open letter[56] to the Lord Provost, as chairman of the Court of Contributors, in which the unprejudiced reader will find a complete vindication of his professional conduct and character.

This episode was doubly unfortunate: it checked the surgical career of Liston for a period of five years, and during that time deprived the infirmary of the services of one of the most brilliant surgeons of his day. It was not until 1827 (*33*), "his imprudence and presumption forgotten," that Liston was appointed one of the surgeons to the infirmary. These anxious and weary years of waiting were

not spent in idleness. With grim determination he overcame the handicap of being without a hospital appointment, and circumvented the open antagonism of his surgical contemporaries. The trend of his mind was towards the practical rather than the scientific side of surgery, and he made the most of his opportunities of acquiring clinical and operative experience. Many of his most famous operations belong to the period when he was waiting for a hospital surgeoncy. In the medical press he found the publicity otherwise denied him, and the short pithy papers he published during these years spread his fame far beyond the bounds of his own school. It is hardly necessary to read between the lines of these contributions to detect the adroit thrusts he makes at the opinions and practices of his surgical opponents.

One of his earliest contributions to surgery was his "Dissertation," read before the Royal Medical Society in 1820 (*26*), on *Fracture of the Neck of the Femur*.[57] He condemned the prevailing practice of neglecting to replace the fragments and to secure immobilization in these fractures, and disputed the view of Sir Astley Cooper that excess of synovia prevents union. He proved from his own experience "that there is no reason why a fracture of the neck of the femur should not unite as well as any other, when put in circumstances favourable to

such an occurrence." The apparatus he favoured for securing extension was the perineal band with Desault's splint—the splint which to this day is known as Liston's long splint, although he laid no claim to its invention.

The same year he published[77] a remarkable series of cases of aneurysm, five in number, which had occurred in his practice "within the last five or six weeks." The first—a case of ossified aneurysmal tumour of the subscapular artery—is interesting as being one of the cases which gave rise to all the trouble with the managers of the infirmary, and was in Liston's own opinion[56] "the very operation which first attracted the notice of patients to me, and which was, indeed, the beginning of any reputation I may have as an operator, beyond the circle of this city, in our own country, or abroad." It is also the first record we have of the successful removal of the scapula by the knife of the surgeon in Britain.

The patient was Robert McNair, aged sixteen, whose case had been the subject of a full consultation of all the surgeons of the Royal Infirmary. "It was deemed by them imprudent and not advisable to attempt any operation. He was, after the application of leeches, dismissed as incurable." When Liston was consulted he took a different view, and next day he "proceeded to the operation in a small, badly lighted room.

"I began by making an incision of a foot long at least, from the axilla to the lower and posterior part of the tumour. The latissimus dorsi was then cut across at about two inches from its insertion, so as to expose the inner edge of the swelling, with a view to tie the subscapular in the first instance. In this I was foiled, owing to its depth, as it passed under the lower edge of the tumour, out of the reach of my fingers. I then proceeded, as is my custom in the extirpation of tumours, to dissect where I expected vessels to enter from the suprascapular. With this view, in detaching it from the spine of the scapula, I felt my finger and knife dip into the body of the tumour. This was attended with a profuse gush of coagula and florid blood. I immediately thrust my sponge into the cavity, so as nearly to command the hæmorrhagy. One of my assistants, at the same time, tried to compress the subclavian, but to no purpose, as the shoulder and arm were much raised to facilitate the dissection in the axilla, which circumstance increased the difficulty of commanding the vessel on the left side. The patient, who had borne the operation well, exhausted by this, and the loss of blood from the very large vessels supplying the tumour, divided in the former incisions, after some efforts to vomit, now dropped his head off the pillow, pale, cold, and almost lifeless. I then only became aware of the nature of the case, and saw that nothing but a bold stroke of the knife could save the boy from immediate death. Pulling out the sponge, therefore, with one rapid incision I completely separated the upper edge of the tumour, so as to expose its cavity; and, directed by the warm gush of blood, immediately secured

with my finger a large vessel at the upper corner, which, with open mouth, was pouring its contents into the sac. With my right hand I then cleared away the coagula, and, dissecting under my finger, separated the great subscapular artery, so that one of my assistants could pass an aneurysm needle under it at its origin from the axillary, and about an inch from the sac. After tying this, and two other large vessels (fully the size of the ulnar) which supplied the sac, I dissected off the tumour from the ribs without further hæmorrhagy, cutting with my knife the carious scapula and under part of the sac. After removing the tumour, I found it necessary to saw off the ragged and spongy part of the scapula, so as to leave only about a fourth part of that bone, containing the glenoid cavity, processes, and half of the spine. In this way, ten muscles were either wholly or partially divided. The edges of the wound were then brought together, and the patient cautiously lifted into bed. At this time he was pale, almost insensible, and without any perceptible pulsation in the greater arteries through the integuments, though the ends of the vessels in the wound beat very forcibly. By the exhibition of stimuli, externally and internally, his pulse could by-and-by be felt, though, on account of its quickness, it could not be counted. In the evening, however, it was at ninety, and soft."

The wound granulated well, and the boy returned in three weeks to his home in Kinross, where, however, he died of recurrence four months later.

In the same journal a few months later[78] he recorded the first successful case in Britain of ligation

of the subclavian artery. It was performed for aneurysm of the axillary. "The patient bore the operation with the greatest courage; with all the preparations, removal and replacement in bed, it occupied about half an hour." In this operation, for the first time he used as retractors the flexible copper spatulas introduced by Colles, and so highly did he appreciate this primitive implement that he says: "I consider them as the greatest addition made to our surgical instruments for many years."

A more important addition to the surgeon's armamentarium was shortly to be made by Liston himself in the form of his bone pliers.[79] This instrument, made for him by "Mr. Young, a most ingenious cutler in College Street," was originally designed to facilitate the resection of long bones, particularly the metacarpals and metatarsals, but was soon found to have a much wider field of usefulness, and is to this day an indispensable implement in bone-surgery.

In 1823 (*29*) Liston performed another operation which caused a great sensation at the time. It was for the "removal of an enormous tumour of the scrotum" (of the nature of elephantiasis) measuring forty-two inches in circumference and extending lower than the patient's knees. "The flow of blood was compared by those present to the discharge of water from a shower-bath; . . . before

half the vessels could be tied the patient sunk off the table, without pulse, and with relaxed muscles voluntary and involuntary. . . . A cordial (good strong whisky) was poured into his stomach, . . . and before much sign of recovery could be observed he had taken one pint of it." After removal the tumour weighed forty-four and a half pounds. In three weeks the patient was able to walk out. In this operation Liston adds: "I had the valuable assistance of my friend, Mr. Syme, without which the result might have been less favourable."[80]

Liston's *Observations on Amputation*[81] reflect the importance attached in these days to rapidity of operating, as well as the haunting fear of pyæmia, and, incidentally, the reliance he placed in his own muscular strength and his pride in it. "As to the tourniquet," he said, "it is in my opinion of no use, and in many cases it is worse than useless . . ." "I have repeatedly, when no proper assistance was at hand, compressed both the femoral and the humeral arteries with the fingers of one hand, whilst with the other I removed the limb, and with the loss of much less blood than if I had followed the ordinary mode."

The suggestion "of that late excellent surgeon, Mr. Hey of Leeds," to apply a ligature to the femoral vein he characterized as a "dangerous expedient," with the comment: "The bad effect of

tying a single vein, even under favourable circumstances, has only to be hinted at to show the impropriety and danger of this practice."

The circular method of amputating was condemned as "complicated, and requiring a considerable space of time for its performance," as well as for other reasons, and he advocated the formation of flaps by transfixion; "but a few seconds will suffice for its performance, in most instances not above ten or twelve."

In his *Remarks on the Operation of Lithotomy*[82] he advocated the use of the stiff lithotomy drainage-tube as a means of preventing extravasation of urine into the cellular tissue about the neck of the bladder, then one of the most common and serious complications of the lateral operation. Here as elsewhere he laid stress on the advantage of operating rapidly: "There can be no apology for the patient being longer than a very few minutes under the operation. Should there be but one or two stones of a moderate size (under the size of a hen's egg), the incisions and extraction should not occupy more than two or three minutes at most."

In 1826 (*32*) he published a short illustrated paper on *Exostosis of the Last Phalanges of the Toes*, "a disease of which I have met with a good many instances, and which, so far as I know, has not been adverted to in any surgical work." The treatment

recommended was "amputation at the joint betwixt the first and second phalanx; an operation quite effectual, and more neatly, quickly, and easily done than the division of the bone."[83]

During the period of his exclusion from the infirmary another cloud arose to mar Liston's happiness. In their earlier years Liston and Syme had been as David and Jonathan. They were fourth cousins — a mysterious Scots relationship difficult to trace; it was through the influence and advice of Liston that Syme took to medicine as a profession; they worked together as demonstrators in Barclay's dissecting-rooms; and together they passed to conduct an independent class of anatomy and surgery. When stress of circumstances inclined Syme to abandon the teaching of anatomy, Liston encouraged him to persevere, and in course of time Syme took over the class which Liston had started. It was to Liston that Syme dedicated his inaugural dissertation for the Fellowship of the Royal College of Surgeons. For a number of years Syme assisted Liston at all his operations, and Liston assisted Syme at his.

Till the year 1823 their friendship was unabated, and their loyal co-operation was mutually stimulating and helpful. It was perhaps inevitable, however, that the constant association of two such brilliantly original exponents of a developing art

should lead to emulation, and that the relationship of allies should in time pass into that of rivals. In any case, it came about that their bearing towards one another gradually became less cordial; "a certain coldness arose between them," and this finally ended in an open rupture. In the case of Liston and Syme this could be no lovers' quarrel. Each was by nature contentious, and the struggle for existence, which both found hard, underlay the discord. Despite a "lingering fondness" which Syme retained for Liston, their differences were apparently incurable, and were carried into every sphere of professional and private life. Their co-partnership in teaching was dissolved; the harmonious co-operation of former years gave place to acrimonious wrangles, and their relations in public were so embittered that when Syme applied for the surgeonship of the Royal Infirmary, the managers "declined to appoint him in the meantime," fearing that the feud between him and Liston might lead to disturbing scenes in the presence of the students Factions were formed on either side: the opposition of the Liston party prevented Syme being appointed Professor of Surgery to the Royal College of Surgeons, and secured the election of his life-long rival, Lizars. The crowning conflict came in 1833, when Syme defeated Liston after a bitter contest for the Chair of Clinical Surgery in the University (p. 191).

Apart from its effects in marring the happiness of the chief parties to it, and in wasting on polemics intellectual faculties that belonged to surgery, this unfortunate disagreement had far-reaching influence on the development of the Edinburgh School. Syme's exclusion from the Royal Infirmary in 1829 led to the foundation of the Surgical Hospital at Minto House (p. 187) and all that that involved. It also influenced Liston in accepting the offer of the Chair of Surgery at University College, London, and so deprived the Surgical School of Edinburgh of one of its brightest ornaments.

It is pleasant to be able to conclude the story of this episode on a more agreeable note. Five years after he left Edinburgh, Liston, "anxious to erase from his memory any ill-feeling, and to recognize the prestige of the great Scottish surgeon,"[46] wrote to Syme that he "could not resist the temptation of saying a few words, with the view of bringing about a reconciliation. . . . I have no angry feelings towards you, and you ought not to have any hostile feelings towards me. . . . Write and tell me that you wish to have our grievances and sores, not plastered up, but firmly cicatrized. . . ."

Syme eagerly grasped the hand thus handsomely held out to him; the old friendship was renewed; a cordial correspondence was carried on; and some years later, when Liston visited Edinburgh, he

spent much of his time under Syme's hospitable roof-tree at Millbank. The happiness of reconciliation was mutual, but it was short-lived, for Liston died suddenly a few months after returning to London, and by none was he mourned more sincerely than by Syme.

Disappointed in his hopes of obtaining a Professorship in Edinburgh, Liston accepted the offer of the Chair of Clinical Surgery at University College and the surgeonship at the North London Hospital which unexpectedly came to him in 1835 (*41*). By his colleagues in London, as well as by the students, he was cordially received ; his fame as an operator attracted to the hospital a large clientele, and his eminence as a teacher added to the reputation of the University. His professional duties and the calls of an extensive private practice did not leave much time for literary work, and beyond his *Practical Surgery*, published in 1837 (*43*), he wrote little of importance after leaving Edinburgh. His clinical lectures, published week by week in the *Lancet*,[71] were highly valued at the time, but add little to his reputation.

The first major operation performed under ether anæsthesia in England was carried out by Liston at University College Hospital in 1846 (*52*). The patient was one Frederick Churchill, a butler, aged thirty-six, the operation amputation through the

thigh. A primitive inhaler had been devised at short notice by Peter Squire, the famous chemist of Oxford Street, and tested by his nephew, Dr. William Squire, who employed it next day at Liston's operation. Dr. F. William Cock's description of the scene may be quoted :[58]

"The well of the theatre is now almost full ; it is 2.15 p.m. A firm footstep is heard, and Robert Liston enters—that magnificent figure of a man, six feet two inches in height, with a most commanding expression of countenance. He nods quietly to Squire, and, turning round to the packed crowd of onlookers, students, colleagues, old students, and many of the neighbouring practitioners, says dryly: 'We are going to try a Yankee dodge to-day, gentlemen, for making men insensible.'

"He then takes from a long, narrow case one of the straight amputating knives of his own invention. It is evidently a favourite instrument, for on the handle are little notches showing the number of times he had used it before. His house-surgeon, Ransome, puts the saw, two or three tenacula, and the artery forceps, named after the operator, on to the chair close by, and covers them with a towel, then threads a wisp of well-waxed hemp ligatures through his own button-hole. 'Ready, Mr. Ransome?' 'Yes, sir.' 'Then have him brought in.' . . .

"The patient is carried in on the stretcher and laid on the table. The tube is put into his mouth, William Squire holds it and the patient's nostrils. A couple of dressers stand by to hold the patient if

necessary, but he never moves, and blows and gurgles away quite quietly. Liston stands by, trying the edge of his knife against his thumb-nail, and the tension increases; the patient's breathing gets deeper, more ether is dropped on the sponge. William Squire looks at Liston and says: 'I think he'll do, sir.' The tube is removed and a handkerchief laid over the patient's face. 'Take the artery, Mr. Cadge,' cries Liston. Ransome, the house-surgeon, holds the limb. 'Now, gentlemen, time me,' says Liston to the students. A score of watches are pulled out in reply. The huge left hand grasps the thigh, a thrust of the long, straight knife, two or three rapid sawing movements, and the upper flap is made; under go his fingers and the flap is held back; another thrust, and the knife comes out in the angle of the upper flap; two or three more lightning-like movements, and the lower flap is cut; under goes the great thumb and holds it back also; a touch or two of the point, and the dresser, holding the saw by its end, yields it to the surgeon and takes the knife in return; half a dozen strokes, and Ransome places the limb in the sawdust. 'Twenty-eight seconds,' says William Squire. 'Twenty-seven,' says Buckell, a student, still living. 'Twenty-six,' echoes yellow-haired Russell Reynolds. 'Twenty-five seconds, sir,' says proud Edward Palmer, the dresser, to his surgeon, who smiles in reply. The femoral artery is taken up on a tenaculum and tied with two stout ligatures, and five or six more vessels with the bow forceps and single thread, a strip of wet lint put between the flaps, and the stump raised. Then the handkerchief is removed from the patient's face, and, trying to raise himself, he says: 'When are you

going to begin? Take me back; I can't have it done.' He is shown the elevated stump, drops back, and weeps a little; then the porters come in, and he is taken back to bed. Five minutes have elapsed since he left it. As he goes out, Liston turns again to his audience, so excited that he almost stammers and hesitates, and exclaims: 'This Yankee dodge, gentlemen, beats mesmerism hollow.'"

Liston's exacting professional duties as one of the leaders in the surgical world of London did not prevent him enjoying the companionship of the many musical and artistic friends he had made. Almost to the end, also, he followed the outdoor sports—shooting, yachting, and hunting—to which he had been devoted all his life. Within three months of his death he rode to hounds, and "crossed the country like Nimrod." On December 7, 1847, at the age of fifty-three, he died suddenly from the effects of an aneurysm of the aorta, attributed to a blow from the boom of his yacht.[58] He was buried in the cemetery adjoining Highgate Hill Church.

It has been said that Liston "was a teacher more by what he did than by what he said," and contemporary evidence seems to indicate that he was not a fluent speaker. Except to his patients, his manner was rough, even rude; "his temper was not quite angelic and rather uncertain," and if any

case was going wrong "the less you came in his way the better."[67]

As a writer he was terse rather than lucid, vigorous rather than impressive; he took little care in selecting his words, and had no distinctive style. His similes were often crude and sometimes even coarse; his attempts at humour too laboured to be effective. He had, however, a considerable gift of satire and a fondness for using it. The merit of his writing lay in its sincerity: he was more concerned with what he had to say than with how he said it. But Liston's great reputation does not rest on what he wrote. His principal works, the *Elements of Surgery* and *Practical Surgery*, we lay down with a feeling that they reveal the real Liston even less than his contributions to the medical Press. It is as an operator that his name lives. For boldness, dexterity, and rapidity he has probably never been equalled. He did not hesitate to lead what seemed to his colleagues a forlorn hope in the combat with disease, but his boldness was far removed from rashness, as the success that attended his most daring operations amply proved. His skill in handling the knife is proverbial; "the bystander," said Erichsen, "was lost in admiration at the wonderful dexterity of the operator."[68] He was at his best in operations that lay out of the beaten track, as there his remarkable coolness and resourcefulness

in the face of unfamiliar emergencies found fullest scope.

He was not unconscious of his prowess, nor did he take pains to conceal his pride in it: witness the assistants who stand stop-watch in hand while he amputates the thigh single-handed, or removes the stone by the lateral operation. "His absurd vanity of passing the catheter with one hand," according to Lizars, brought to naught the boast he made shortly before leaving Edinburgh that he had never failed in passing a catheter. One of his surgical mistakes is historical; it may be cited as illustrating his coolness and decision in the face of a trying emergency. A patient presented a soft swelling in the neck, into which Liston plunged a knife in the belief that it was an abscess. There was a gush of blood. "Give me a hare-lip pin," said he calmly; after passing it through and fixing it, he added, "To-morrow we will tie the carotid." He did so, but the patient ultimately died, the case being one of scrofulous glands with suppuration opening into the vessel.[58]

A bust of Liston by Thomas Campbell stands in the Board Room of the Royal Infirmary, and a portrait is in the hall of the Royal College of Surgeons, Edinburgh. Several engravings are extant, one by J. C. Bromley; and a tinted lithograph was done by Count D'Orsay six months before his death.

The Introduction of Anæsthesia

To this period belongs the introduction of anæsthesia, one of the greatest contributions ever made to the progress of surgery. The abolition of pain during operations had been the dream of surgeons for generations,[93] but it was not until 1846 that it became an accomplished fact. Wells at Hartford, acting on a suggestion made by Sir Humphrey Davy[61] half a century before, proved in his own person that a tooth might be extracted without pain while he deeply inhaled nitrous oxide gas. His pupil, Morton of Boston, by administering the vapour of sulphuric ether, obtained a state of anæsthesia sufficiently prolonged to permit not only of dental but also of surgical operations being carried through without suffering. Later in the same year Robert Liston (p. 164) performed the first painless operation in England—amputation through the thigh—under ether anæsthesia, and his success stimulated James Young Simpson to employ the same means to abolish the pains of parturition. For the latter purpose ether did not prove an ideal anæsthetic, and Simpson set himself to discover a better. The story of the discovery of the anæsthetic properties of chloroform has often been told, but Professor Miller's version of it will bear repetition here.[85]

"Most of these experiments were performed after the long day's toil was over, at late night or early morn, and when the greater part of mankind were soundly anæsthetized in the arms of common sleep. Late one evening—it was the 4th of November, 1847—on returning home after a weary day's labour, Dr. Simpson, with his two friends and assistants, Drs. Keith and J. Matthews Duncan, sat down to their somewhat hazardous work in Dr. Simpson's dining-room. Having inhaled several substances, but without much effect, it occurred to Dr. Simpson to try a ponderous material, which he had formerly set aside on a lumber-table, and which, on account of its great weight, he had hitherto regarded as of no likelihood whatever. That happened to be a small bottle of chloroform. It was searched for, and recovered from beneath a heap of waste-paper. And, with each tumbler newly charged, the inhalers resumed their vocation. Immediately an unwonted hilarity seized the party; they became bright-eyed, very happy, and very loquacious, expatiating on the delicious aroma of the new fluid. The conversation was of unusual intelligence, and quite charmed the listeners—some ladies of the family and a naval officer, brother-in-law of Dr. Simpson. But suddenly there was a talk of sounds being heard like those of a cotton-mill, louder and louder; a moment more, then all was quiet, and then—a crash. On awakening, Dr. Simpson's first perception was mental: 'This is far stronger and better than ether,' said he to himself. His second was, to note that he was prostrate on the floor, and that among the friends about him there was both confusion and alarm. Hearing a noise, he turned round and saw Dr. Duncan

CHAPTER XII

JAMES SYME

(1799-1870)

James Syme — Chemical Studies — Anatomical Studies — Surgeon's Clerk in Royal Infirmary—Royal Medical Society Dissertation on Caries—Studied in Paris—First Amputation at Hip in Scotland — Teaching — Early Surgical Writings—Minto House—Further Writings—Professor of Clinical Surgery—The London Episode—Return to Edinburgh—Later Writings—Classical Operations—Controversies—Death—Lister's Estimate of Syme.

JAMES SYME—the Napoleon of Surgery—was born at No. 56, Princes Street, opposite where the Scott Monument now stands, on November 7, 1799.[46] From his father, John Syme, a Writer to the Signet in Edinburgh and a landed proprietor in the counties of Kinross and Fife, he inherited those qualities of acuteness, sagacity, obstinacy, and perseverance that characterized him throughout life. Shy and reserved, as a boy he made few bosom friends among his High School companions, and he shared little in their outdoor sports. With a few selected friends of kindred spirit he spent much of

JAMES SYME
Professor of Clinical Surgery.
(*From a photograph in the Author's Collection.*)

his spare time in the fields "considering the lilies," and acquiring a knowledge of plant life from which sprang a love of flowers that was one of his most abiding pleasures to the end of his days. His favourite youthful pastime, however, was chemistry, on which he spent all his pocket-money and more of his time than his teachers thought proper. In his father's house at Pitreavie he fitted up a laboratory, where he acquired remarkable skill in manipulating chemical apparatus, and when he became a member of Dr. Hope's class in the University, he, along with Robert Christison and a dozen other students, founded a Chemical Society, which met once a week to repeat the Professor's experimental demonstrations—the first attempt at practical study of this subject made in Edinburgh.

As a result of his private investigations on the distillation of coal-tar Syme discovered a solvent for caoutchouc, and he found that by brushing a solution of indiarubber in a fluid state on a silk cloak he rendered it waterproof. This discovery he submitted to the editor of the *Annals of Philosophy*, but publication was delayed, and before Syme's paper had appeared a Mr. Macintosh, a manufacturer in Glasgow, had taken out a patent for the process, and thereby laid the foundation of a fortune and secured an adventitious immortality for his name.

Syme's choice of medicine as a profession was made in 1817, after he had spent two years at the University in the study of Latin, philosophy, and natural science. He began his medical studies in the anatomy rooms at Surgeons' Square, attracted thither by the fame of Dr. John Barclay as an anatomist and teacher, and by the presence of his friend Robert Liston, who was the principal demonstrator. Inspired by Barclay and directed by Liston, Syme quickly mastered the elements of the subject, and ere long he was sufficiently proficient to act as a demonstrator. His early association with Liston in anatomy and surgery has already been referred to (p. 161), and the story of their harmonies and discords need not be gone over again. Suffice it to recall that when Liston left Barclay's rooms in 1818 to commence a course of lectures on anatomy on his own account, Syme accompanied him as demonstrator and assistant, and that five years later he took over the class when Liston relinquished anatomical teaching.

To Syme the study of anatomy was but a means to an end, and closely as he pursued it, it was ever with the object of fitting himself for the practice of surgery. The work of the hospital was more congenial to him than that of the dissecting-room, and even the exacting claims of a large anatomical class did not prevent his devoting much of his time

and attention to clinical work. He acted for a time as medical superintendent of the fever hospital, and then became surgeon's clerk in the Royal Infirmary under Mr. William Newbigging. Much of the clerk's time was occupied in performing phlebotomy, and it is told that on one occasion Syme incurred the displeasure of his chief, whose faith in the efficacy of bleeding he did not share, by giving beef-steak and porter to a youth enfeebled by long-continued suppuration, from whom he had been ordered to withdraw fourteen ounces of blood. The surgeon's instructions were repeated and carried out, but "forty-eight hours saw the last of the poor sufferer."

The Royal Medical Society afforded Syme, as it has done to so many others, his earliest opportunity of submitting his opinions to the criticism of his contemporaries. In his dissertation *On Caries of the Bones*,[57] read before the Society in 1821, when he was twenty-two years of age, we find that firm grasp of essential principles and that terse, incisive, even disputatious literary style which was so conspicuous in all his later work. His essay begins:

"Mr. President, the truly deplorable ignorance of many surgical practitioners regarding the diseases of bones is most astonishing, especially when we consider the frequency and importance of these affections. I am convinced that the trepans and rugines of our fathers in surgery, though often misapplied,

did, on the whole, much less mischief and infinitely more good than the poultices of our brethren of the present day." . . . "Caries, to many surgeons, conveys no precise meaning of the particular morbid action to which it is applied in correct language." . . . "I wish, therefore, to characterize it so clearly that the merest surgical tradesman may never mistake it for a healthy action. While making distinctions, it will not be amiss to observe that surgeons may be divided into those who practise their trade merely, and those who also study their profession. To the former, already established in practice, I certainly have not the presumption to expect I shall be of any use, for men who do not think, and will not be convinced by what they see, are truly in a hopeless state. But to those gentlemen who constitute the latter division, and to the rising generation of the former, the following observations may not be altogether useless." He pointed out that much of the confusion that existed regarding the disease called caries was due to a failure to discriminate between the reparative and destructive processes that occur in bone. When this is done the relation of the carious process to different bone diseases becomes clear.

This paper contains one of Syme's earliest observations in surgical pathology:

"When an ulcer happens over a vascular bone, I have observed (and to the best of my knowledge the observation is new) that the bone, instead of exfoliating and getting carious, may simply have its vessels stimulated to an increased action, so that instead of displaying a loss of substance, it is

much increased in surface, and seems everywhere as if shooting out into stalactites."

The rational treatment of caries, he pointed out, consists in following the example of Nature: "Whenever she succeeds in obtaining a cure it is by putting to death the ill-disposed bone." The red-hot iron he preferred to caustics, and the simple gouges and bone pliers devised by Liston to the intricate appliances then in favour. His rooted aversion to complicated instruments finds vent in the following passage: "The chain saw, I am inclined to think, both from the testimony of others and my own experience, never succeeded in cutting through a bone ever since it made its entrance into this inventive world. And as to the saw of Machel, I am ready to allow that it is a very pretty mechanical contrivance, but how it should enter the head of any man that such an apparatus could be of any use in surgery excites my astonishment in no small degree."

In 1822 (*23*), along with his life-long friend Sharpey, he attended the clinics of Dupuytren at the Hôtel Dieu in Paris, and went through a course of operative surgery under Lisfranc. It was during this visit that Syme presented Dupuytren with a pair of Liston's bone-cutting forceps, and had the satisfaction of seeing them used by the great surgeon, who expressed himself much pleased with the instrument.

In 1823 (*24*), the year in which he became a Fellow of the Royal College of Surgeons of Edinburgh, Syme established his position as an operating surgeon by carrying through successfully the first amputation at the hip-joint performed in Scotland. The patient was a lad, William Fraser, aged nineteen, "tormented for nearly three years with necrosis of the thigh." Assisted by his "much esteemed friend and instructor, Mr. Liston," Syme proceeded to remove the limb by the method he had been taught by Lisfranc, and he thus describes the operation:[86]

"Having, with some difficulty, placed the patient upon a table, so that the affected limb was perfectly free, and ascertained that Mr. Liston was ready to make pressure when and where required, I introduced a narrow knife about a foot long in the blade, which was sharp on one edge only, at the proper place for transfixing the limb. But being prevented by the bent position, in which, owing to long habit, the patient obstinately retained it, from passing onward in the direction of the tuberosity of the ischium, by the neck of the femur, I lost no time in the repetition of fruitless attempts, but instantly changed my plan. Without removing the point of the knife, I brought down its edge obliquely, and, by a sawing motion, quickly cut back in a semicircular direction to the tuberosity of the ischium, up along the femur, and round the trochanter major, so as to form very speedily identically the same flap which would have resulted from the plan

I meant to have followed. While Mr. Liston covered the numerous cut arteries with his left hand, and compressed the femoral in the groin by means of his right, I gathered together all the mass of undivided parts on the inner side of the thigh with my left hand, and then insulated the neck of the bone by passing the knife close past its lower surface. I now cut close down along the bone for some way below the trochanter minor, and lastly made my way outwards obliquely, so as to form a good internal flap.

"Mr. Liston holding aside the flaps, I made a single cut with my long knife upon the head of the bone, which started, with a loud report, from its socket, as soon as abduction was performed; finally, I passed the knife round the head of the bone, cut the triangular and remaining portion of the capsular ligament, and thus completed the operation, which certainly did not occupy at the most more than a minute. I then proceeded to take up the arteries. As soon as the femoral was secured, Mr. Liston relaxed his hands, in order that we might form some estimate as to the size and number of bleeding vessels; and then, had it not been for thorough seasoning in scenes of dreadful hæmorrhage, I certainly should have been startled, prepared as I was to expect unusual vascularity, owing to the extensive action so long carried on in the limb.

"It seemed indeed, at first sight, as if the vessels which supplied so many large and crossing jets of arterial blood could never all be closed. It may be imagined that we did not spend much time in admiring this alarming spectacle; a single instant was sufficient to convince us that the patient's safety required all our expedition, and in the course

of a few minutes hæmorrhage was effectually restrained by the application of ten or twelve ligatures. About a month after the operation the wound was nearly healed, and the prospect of the patient's return to health and strength was bright; but symptoms of ascites from diseased liver soon after showed themselves, and, increasing, cut him off in the eighth week after the operation. I am no advocate for operations whose only interest is their danger, and assuredly regard the knife at all times as a great though too often necessary evil; yet I feel no hesitation in recommending to the serious attention of operating surgeons amputation at the hip-joint, although it be the greatest and bloodiest operation in surgery; for I am sure that there is sometimes no other mode of prolonging existence."

For the next five years (*24-29*) Syme's chief occupation was with teaching: first of anatomy and surgery in association with Liston; later of surgery and anatomy after he had broken with his friend; and finally of surgery pure and simple, when he could no longer endure the endless wrangling with the odious "purveyors" of anatomical material. His classes did not, however, absorb his whole attention. The success of his amputation at the hip and his almost intuitive powers of diagnosis soon brought him repute, and he rapidly acquired a fair share of consultative and operative work. The use he made of his opportunities is best seen from the papers he published during this period, which reflect his

penetrating insight into the science of surgery and his firm grasp of the principles governing its practice.

In his *Remarks on Amputation*[86] he made a telling attack on the "circular" method: "Of all the operations ever adopted for amputation, I certainly look upon this one as the worst, inasmuch as it is tedious, painful, and little calculated for leaving the sound parts in a good state either for healing or forming a proper covering for the bone." "How . . . it should still meet with such general patronage I am at a loss to explain, unless, indeed, the equality which it establishes, as far as amputation is concerned, among all operators good and bad, be its redeeming virtue."

This youth of twenty-five did not hesitate to differ even from "the celebrated Baron Dupuytren of Paris," whom he regarded "as unquestionably the best anatomist, profoundest pathologist, and ablest surgeon of the age we live in." Syme's advocacy of the flap method, which he frankly admits he had learned to appreciate from observing Liston's work, did much to make it popular in Scotland.

His clinical observation, as well as a painful personal experience, led him to question some of the methods then employed to secure that "union by the first intention" which all surgeons aimed at

but so few obtained. "Many students have assured me," he says in his *Remarks on the Treatment of Incised Wounds*,[87] "that in the whole course of their hospital attendance they never saw an instance of union by the first intention, except in cases of cancer or hare-lip and venesection." This lamentable state of affairs he attributed to the prevailing practice of completely closing incised wounds, covering them with imbricated layers of that "infallible preventive of adhesion, adhesive plaster," and leaving them undisturbed in "a long bandage tightly and curiously turned" for "a statutory period" of four days. This ritual he traced to the days when wounds were healed by balsams and incantations, which "could work successfully only in secret," and he vigorously attacked those who adhered to methods so incompatible with the natural processes concerned in repair. "The sealing up of wounds is the most certain means of keeping them open," he said, and his advocacy of free drainage led to a most important change in the surgical practice of his day.

Syme's earliest experiment in a field to which he subsequently contributed so much—the excision of joints—belongs to this period. In 1826[88] he excised the head of the humerus for carious disease that had existed for seven years, thus reviving "the bold but prudent and successful innovation of White of

Manchester," which British surgeons had neglected for nearly sixty years.

Two years later he published his famous case of excision of the lower jaw for osteo-sarcoma.[89] The tumour was the largest that had ever been removed by operation: "the mouth was placed diagonally across the face, and had suffered such monstrous distortion as to measure fifteen inches in circumference." The portraits of the patient which accompany the description of the operation "give some notion of what mere words are altogether inadequate to express," and fill us with amazement at the audacity of Syme in undertaking to remove it—a task which had prudently been declined by several operating surgeons. The result, however, justified him. With the patient seated on an ordinary chair to prevent suffocation from hæmorrhage, the enormous mass was removed in twenty-four minutes, "a little respite being frequently allowed to prevent exhaustion from continued suffering." The patient, who "possessed uncommon fortitude," bore it well, and did not lose more than seven or eight ounces of blood. Five weeks later he was "quite well, and thinking of resuming his occupation."

It is to be borne in mind that these and many other difficult and dangerous operations were performed in the humble homes of poor patients,

where the surroundings were unfavourable, the appliances had to be extemporized from household chattels, the nursing facilities were primitive, and the nursing itself unskilled. They were attended with a degree of success that would have been notable even in a fully equipped hospital. Syme, however, had not as yet the advantage of holding a hospital appointment. His hopes in this direction seemed about to be realized in 1829, when a vacancy occurred in the Royal Infirmary, but under circumstances that have already been related (p. 162) they were doomed to disappointment.

Syme had now reached a critical stage in his career. What patient industry, deep reflection, and the exercise of the talents nature had given him could do to fit him for the vocation of his choice had been done. He had made for himself a position and a name such as few of his years had ever attained. But without a place on the staff of a public hospital he could not go much farther. The door of the infirmary had been closed upon him, and the signs were not favourable to an early reopening.

James Syme was not the man to stand, cap in hand, waiting for favours. He was humbly conscious of his own powers, proudly confident of his ability to succeed, and fearless in the face of difficulties. If there was no place for him among his

compeers he must make a place for himself, and wear the spurs he had already won on a field of his own choice.

His own plan was nothing less than to establish a surgical hospital for himself. On the north side of what is now Chambers Street stood Minto House, once the town house of the Elliots of Minto, and this being available, Syme promptly secured it on a long lease. A square, well-appointed house of fifteen rooms, surrounded by adequate pleasure-grounds, situated in convenient proximity to the University and the infirmary, as well as to the densely populated part of the old town, Minto House was admirably adapted to its new purpose. The principal room was converted into an operating-theatre and lecture-room; provision was made for twenty-four beds; and accommodation was provided for the resident staff. While the alterations were being carried out a prospectus for the information of the public was circulated, and the College of Surgeons granted Syme's request that his lectures should qualify for their diploma. In response to an advertisement for two house-surgeons, each to *pay* £100 for board, ten applications were received. A number of apprentices became indentured to Syme—the apprentice system was still in vogue—and part of their fees went towards the financing of the venture. Students applied for

admission in large numbers, but only forty were accepted, their fees yielding a sum of £250. The response of the public was encouraging, and a number of influential citizens agreed to act as a Board of Directors.

The "Surgical Hospital" was opened on May 8, 1829 (*30*). During the first three months 380 patients applied for relief, 70 were admitted into the house, and 30 operations were performed, with two deaths, both following upon severe accidents. The first patient admitted to the hospital was still alive in 1870, when Syme died.

Stimulated by the formidable rivalry of Liston and Lizars in the Royal Infirmary, and Fergusson outside, as well as by his obligations to students, apprentices, and contributors, and loyally supported by his devoted henchmen, Alexander Peddie and John Brown, Syme threw his whole energy into the venture, with what success the *Quarterly Reports* show. Quarter by quarter the number of patients seeking admission increased; operations became more numerous and more important; the building had to be extended to provide additional beds, and the reputation of the hospital came to rival even that of the Royal Infirmary.

It would not be too much to say that during the five crowded years he spent in Minto House, Syme was making, as well as practising and teaching,

surgery. To these years we trace his method of treating indolent ulcers by blistering; the proof of the value of the actual cautery in diseases of bones and joints; the demonstration of the mechanism by which hæmorrhage is arrested in lacerated arteries; the first case of division of the sterno-mastoid for wry neck in this country; his earliest excisions of the elbow and knee joints; and the first of the wonderful series of operations for aneurysm which brought the "old operation" back to its own. In all the "great operations of surgery" of the time — amputations, excisions of tumours, lithotomy, hernia, trephining, excisions of joints, and rectal operations—he gained a wide experience and prepared the way for many of the improvements he subsequently introduced in almost every department of surgical work.

Many of the reports of Syme's operations are famous: one is a classic. John Brown was the clerk who posted the notice on the stair of Minto House: "*An operation to-day*," and wrote the record of that operation. It was for the removal of a cancerous breast; the brave and gentle Ailie was the patient, and the immortal Rab, "his soul working within him," the most intent spectator. In that idyllic clinical record the fame of old Minto House is enshrined.[62]

Another valuable contribution to practical sur-

gery was made by Syme when, in 1831, he published his *Treatise on the Excision of Diseased Joints.* It is true that as far back as 1770, in England, White, Bent, and Orred had made tentative efforts to avoid the necessity of amputating by removing the articular ends of diseased bones, and twenty years later, Moreau, father and son, in France, had done the same; but in the interval the operation had fallen into disrepute and had been abandoned. Syme revived it, and to the success of his practice and the perseverance with which he advocated it in the face of much opposition we owe the establishment of excision of joints as one of the most brilliant achievements of conservative surgery. He lived to see the principle universally accepted, and surgeons vying with one another in devising "modifications" and "improvements" in the methods of putting it into practice. Syme's impressive plea for excision as an alternative to amputation was a lasting contribution to conservative surgery. Of his work in this direction it has been said: "If he had done nothing else, he would have been one of the greatest benefactors of the human race."[90]

The first edition of his *Principles of Surgery* appeared in 1831 (*32*). This remarkable book, true to its title, enunciated a few broad and safe general principles and applied them to the whole range of practical surgery. With a consistency characteristic

of Syme's mode of thought, his "principles" became simpler and clearer the more they were applied, and the fifth edition, published in 1863 (*64*), was more elemental than the first.

The success of the surgical hospital venture was now complete. Syme had raised himself to the front rank of British surgeons, and had only one serious rival in Edinburgh—Robert Liston. In 1833 the veteran Professor of Clinical Surgery resigned, and Liston and Syme were once more brought into active conflict as candidates for the Chair. Professor Russell, now aged eighty-one, had made his resignation contingent on his successor paying him a retiring allowance of £300 a year for the remainder of his life. Liston refused to consider this condition, but Syme, after open and honourable negotiation, agreed to it, and was appointed. The managers of the infirmary could no longer afford to exclude him from the staff, and he was allotted three wards containing thirty beds. At the same time the Senatus Academicus added Clinical Surgery to the list of classes imperative on candidates for graduation.

Syme's battle was won. He had forced the doors of the infirmary, established himself in the premier Surgical Chair, and secured academic recognition for his special subject.

The need for Minto House as a surgical hospital

having passed, it was converted into a *maison de santé* and dispensary, and for fifteen years, under the charge of Dr. Alexander Peddie, Dr. John Brown, and Dr. Cornwall, filled a useful place amongst the medical charities of Edinburgh. Later it was transformed into a branch of the Extra-mural School.

The teaching of clinical surgery in Edinburgh received a new impetus on Syme's accession to the Chair. In place of the systematized dissertation on some allied group of diseases, illustrated by the records of selected cases under treatment in the hospital, that had previously done service as a clinical lecture, he introduced to the infirmary the method he had so successfully practised at Minto House. It is best described in his own words:[72]

". . . To bring the cases one by one into a room, where the students are comfortably seated, and if the patients have not been seen by the surgeon beforehand, so much the better; then ascertaining the seat and nature of their complaints, he points out their distinctive characters.

"Having done this so that everyone present knows the case under consideration, the teacher, either in presence or absence of the patient, according to circumstances, proceeds to explain the principles of treatment, with his reasons for choosing the method preferred; and, lastly, does what is requisite in the presence of the pupils.

"The great advantage of this system is that it

makes an impression at the same time on the eye and ear, which is known by experience to be more indelible than any other, and thus conveys instruction of the most lasting character."

The students were questioned as to the diagnosis and treatment, and were given opportunities of personally examining the patients. They were in addition taken round the wards to enable them to follow the progress of the indoor patients. With certain modifications the system introduced by Syme is still followed in Edinburgh, and indeed in most medical schools.

As a teacher Syme at once took the leading place in Edinburgh, but for two years Liston rivalled him as an operator and contested with him the consulting practice of Scotland. In 1835, however, when Liston removed to London (p. 164), Syme was left in undisputed possession of the whole field, which he maintained till the time of his death thirty-five years later.

Syme's tenure of the Edinburgh Chair was interrupted by a strange episode. On the unexpected death of Liston in 1847, he was offered, and accepted, the Professorship of Clinical Surgery at University College. He went to London on February 13, 1848 (*49*), was cordially received by the heads of the medical profession as well as by the students, with whom he became very popular,

and who "invariably paid him great respect." Certain undercurrents of feeling, however, were at work which made him uncomfortable, and when the Council of the College sought to impose upon him the duties of the Systematic Professor in addition to those of his own Clinical Chair, he found an opportunity of withdrawing from an uncongenial position. He recognized that "ambition had made him sacrifice happiness," and on July 3, with no feelings of regret, he bade adieu to London and returned "home."

His Chair still being vacant, he was reinstated in it, as well as in his office as surgeon to the Royal Infirmary.

The high-water mark of pre-Listerian surgery in Edinburgh was reached during the period when Syme filled the Clinical Chair, and for forty odd years his name not only shed a lustre on his own school, but brought distinction to British surgery. Adequately to estimate the share he took in the advancement of his art would necessitate a review of the progress of surgery during that period, but this is beyond our present purpose. This double task he performed for us in his own terse and lucid way when he addressed the British Medical Association at Leamington,[91] and here we need only refer to some of his most important contributions.

The amputation at the ankle-joint that goes by his name stands pre-eminent. It was first performed in 1842 (*43*), and is still accepted as the best operation of its kind. When it is borne in mind that it was introduced as a substitute for amputation below the knee, then the operation of choice for disease of the ankle, and that it not only preserves the leg, but leaves a stump on which the whole weight can be borne, this operation may with justice be ranked among the triumphs of conservative surgery. It has been said that "on this achievement alone Mr. Syme might have based his reputation as one of the greatest surgeons that ever lived."[90]

Parenthetically, the story of this operation vividly recalls to us the pre-anæsthetic era of surgery, for Professor George Wilson, the second patient on whom Syme performed it, has left on record his emotions during the ordeal.[40] "During the operation," Wilson says in a letter to Simpson, "in spite of the pain it occasioned, my senses were preternaturally acute. I watched all that the surgeons did with a fascinated intensity. Of the agony it occasioned I will say nothing. Suffering so great as I underwent cannot be expressed in words, and thus fortunately cannot be recalled. The particular pangs are now forgotten, but the black whirlwind of emotion, the horror of great

darkness, and the sense of desertion by God and man, bordering close on despair, which swept through my mind and overwhelmed my heart, I can never forget, however gladly I would do so."

Syme's experimental investigation *On the Power of the Periosteum to Form New Bone*, communicated to the Royal Society of Edinburgh in 1837 (*38*), anticipated the work of Ollier by twenty years, and was an important contribution to a chapter in surgical pathology which is not yet closed.

It is doubtful if any single operative procedure ever gave rise to more acrimonious discussion than did Syme's operation of perineal section for obstinate stricture of the urethra. First performed in 1840 (*41*), its introduction to the profession four years later was met by a perfect tornado of abuse, in which John Lizars played the leading part. Supported by a coterie of surgeons whose names are now for the most part forgotten, he attacked the operation in magazine articles, letters to editors, pamphlets, and booklets with extraordinary rancour. The merits of the operation were soon lost sight of as the controversy degenerated into an unedifying personal quarrel between the protagonists, and eventually led them into the law courts. By the end of 1849 Syme had performed the operation 108 times, with only two fatal results, and these were due to pyæmia. Despite its detractors, the

operation established itself as one of the standard procedures of surgery.

The treatment of aneurysm bulked more largely in surgical practice in Syme's day than it does in ours. The brilliant results of the Hunterian operation in popliteal aneurysm had led to the principle of proximal ligation being applied to aneurysms in other situations where the conditions for success were less favourable, and the "old operation" of laying open the sac and securing the ends of the vessel fell into disuse. Syme's chief contribution to this branch of surgery was the revival of the "old operation" of Anel. Towards the Hunterian operation he avowedly had "no prejudice or hostile feeling"—he performed it with success in thirty-four out of thirty-five cases of popliteal aneurysm as well as in other forms of aneurysm—but he soon recognized that its sphere of usefulness was limited, especially when the axillary, carotid, iliac, and gluteal arteries were involved. Experience had shown, for example, that the earlier operations for axillary aneurysm on the Hunterian principle were literally "mortifying failures," fully fifty per cent. ending fatally "from the effects of hæmorrhage, inflammation, or deep-seated suppuration." The risk from bleeding, which deterred some of his contemporaries from performing the old operation, had no terrors for Syme, nor did he mistrust the

security of the ligature applied close to the dilated part of the vessel. The records of some of his operations in this field are amongst the surgical classics, and one or two may be cited.

The first is a case of axillary aneurysm, which for the first time brings us into touch with "Mr. Lister."

"D. L., *æt.* forty-seven, applied for admission into the hospital on January 26, 1860, on account of a large tumour, which completely filled the left axilla, and greatly distended the muscles, before as well as behind the shoulder. The skin was tense, but not at all discoloured, and an obscure fluctuation could be perceived throughout the whole extent of the swelling, which the patient positively stated had not existed more than a week, although for nearly two months he had felt pain in his shoulder, and observed that there was no pulse at the wrist. There was a distinct aneurismal bruit, but no pulsation that could be felt in the tumour, except at its upper part, which projected above the clavicle. . . .

"In the course of a few days after admission the tumour enlarged considerably, and assumed a dark colour at some parts of its surface; while a slough formed over the scapula, where the pressure was most severe. At the same time the patient began to wander in his ideas, and his pulse rose to 130. It was therefore manifest that unless some decided steps were taken without delay to afford relief, the result must very soon prove fatal. Ligature of the subclavian was quite out of the question, from the tumour extending above the clavicle; and amputation at the shoulder-joint at first seemed to be the

only alternative. But before proceeding to this desperate remedy, I felt desirous of ascertaining the state of matters in the axilla, and therefore proceeded in the following manner:

"On February 1, chloroform having been administered, I made an incision along the outer edge of the sterno-mastoid muscle, through the platysma myoides and fascia of the neck, so as to allow a finger to be pushed down to the situation where the subclavian artery issues from under the scalenus anticus and lies upon the first rib. I then opened the tumour, when a tremendous gush of blood showed that the artery was not effectually compressed; but while I plugged the aperture with my hand, Mr. Lister, who assisted me, by a slight movement of his finger, which had been thrust deeply under the upper edge of the tumour and through the clots contained in it, at length succeeded in getting command of the vessel. I then laid the cavity freely open, and with both hands scooped out nearly seven pounds of coagulated blood, as was ascertained by measurement. The axillary artery appeared to have been torn across, and as the lower orifice still bled freely, I tied it in the first instance. I next cut through the lesser pectoral muscle, close up to the clavicle, and, holding the upper end of the vessel between my finger and thumb, passed an aneurism needle, so as to apply a ligature about half an inch above the orifice. The extreme elevation of the clavicle, which rendered the artery so inaccessible from above, of course facilitated this procedure from below. Everything went on favourably afterwards. The edges of the wound, which had been brought together by stitches of the silver suture, united

chiefly by the first intention. The ligature was found loose on the thirteenth day, the pulse gradually decreased in frequency as the patient regained his strength, and the discharge, which was at first profuse and mixed with clots of blood, progressively diminished. He was dismissed on March 14, six weeks after the operation, and before long resumed his employment, in possession of perfect health."

In the next case the aneurysm involved the common carotid artery, and was due to a stab wound sustained in a brawl.

"The patient, a young man *æt.* twenty, was admitted into the hospital on June 10. The aneurism, which was about the size of an orange, extended in a transverse direction from the trachea to the outer edge of the sterno-mastoid, and downwards close to, or rather under, the clavicle, throbbing throughout with great force. Nearly at the centre there was a cicatrix, showing where the wound had been. In the course of a few days, notwithstanding confinement to the horizontal posture and low diet, there was a distinct enlargement of the tumour, so that it seemed necessary to decide without delay upon the course to be pursued.

"The case was obviously one of great responsibility, involving, as it did, not only the patient's life, but also that of his assailant. There could be no doubt that if the aneurism were allowed to proceed it would before long prove fatal, by interfering with respiration, or opening inwardly, if it did not do so upon the external surface. On the other hand, it

was evidently impossible to tie the artery below the tumour, while an aperture could not be made into it without subjecting the patient to instant and extreme hazard. The wound of the artery might be opposite the cicatrix, but it might also be situated at a lower point if the knife, as was not improbable, had a downward direction, in which case it would hardly be possible to apply a ligature; and, wherever situated, it could afford little assistance in discovering the vessel, since the pressure which had been in operation for nearly two months must have so consolidated the textures as to render their recognition and separation equally difficult. There thus seemed to be not only a great risk of the hæmorrhage proving incontrollable, but also a hardly less formidable danger of injuring the internal jugular vein. Having carefully balanced these different considerations, I arrived at the conclusion that it was my duty to give the patient his only chance of escape, and proceeded to perform the operation on June 17.

"Chloroform having been fully administered, and the patient being placed upon his back, with his shoulders slightly elevated, I pushed a knife through the cicatrix and followed the blade with the forefinger of my left hand so closely as to prevent any effusion of blood. I then searched through the clots and fluid contents of the sac for the wound of the artery, and found that pressure at one part made the pulsation cease. Keeping my finger steadily applied to this point, I laid the cavity freely open both upwards and downwards, turned out the clots, and spunged away the fluid blood so as to get a view of the bottom, which presented the smooth shining aspect of a

serous membrane, without the slightest indication of either the artery or vein that could be seen or felt. In order to make the requisite dissection, I next attempted to close the orifice by means of forceps, but found that it had the form of a slit which could not be thus commanded. It was also so near the clavicle that pressure could not be employed below it, and, to my still greater concern, lay on the inner, or tracheal side of the vessel, so that the compression required for its closure, instead of being backwards upon the vertebræ, was outwards upon the vein. In these circumstances it seemed proper, so far as possible, to lessen the opposing difficulties, and I therefore ran a bistoury through the skin and the sternal portion of the sterno-mastoid, so as to divide this part of the muscle together with the superjacent integument. I then seized the edge of the slit in the artery, as it lay under my finger, with catch forceps, and desired them to be held so as to draw the vessel towards the trachea, while still subjected to compression; then carefully scratched with the point of a knife until the arterial coat was brought into view at its external edge, a little above the aperture, where a ligature was passed by the needle and tied. I repeated the same procedure below the wound, and, when it was completed, had the satisfaction of finding that my finger could be withdrawn without the slightest appearance of bleeding, instead of the tremendous gush which had previously attended its slightest displacement. The ligatures separated on the tenth day, and the patient, who had suffered no inconvenience since the operation, was dismissed on July 17.

"I have thus particularly related the steps of this

operation because it was by far the most arduous that has ever occurred in the course of my surgical experience. Indeed, even now I cannot, without a shudder, reflect on my position when the slightest displacement of one hand must have instantaneously caused a fatal hæmorrhage from the carotid artery, and a wrong direction of the needle by the other, to the smallest possible extent, would have given issue to an irrepressible stream from the jugular vein."

The last—a case of gluteal aneurysm—is quoted as a companion to the famous case of John Bell (p. 71).

"J. C., *æt.* forty-four, from Carlisle, was admitted on June 9 last, suffering from a very formidable aneurism of the left buttock. He stated that seven years ago, having been employed in cutting willows for basket-making, he placed in his coat-pocket the knife employed for this purpose, which had a long, narrow, and sharp blade, with a large, thick wooden handle, and then threw the bundle of osiers which he had collected over his shoulder. In doing this he struck the knife with such force as to drive it deeply into the hip, and caused the blood to flow with great profusion. Soon afterwards he was found lying in a very exhausted state by some children, who had him conveyed to the Carlisle Infirmary, where, bleeding having ceased, the wound was dressed superficially, and healed, with the result of a pulsating tumour, the size of an orange, being formed at the part. This had occasioned little inconvenience, and rather been a subject of amusement to himself and friends, until lately,

when it suddenly enlarged and became the source of pain, which was constantly severe, but occasionally increased to a degree that was almost intolerable. He had on this account again applied to the Carlisle Infirmary, and resided there for two or three weeks, during which an embrocation had been employed and a plaster prescribed. He then left the hospital, and was recommended to my care by Dr. Elliot.

"On examination I found an enormous tumour, measuring more than thirteen inches across, in both of its directions, extremely tense, and pulsating strongly, while the pain had become still more intolerable through the fatigue of travelling. It was evident that there should be no delay in resorting to some effectual means of relief, and of these I could not hesitate in preferring the old operation, since, although the case was more favourable for ligature of the internal iliac than the one in which I had recently operated, from the greater thinness and laxity of the muscular coverings, the large size of the tumour was opposed to the process of coagulation and absorption, while the patient's history clearly showed that the vessel must be within reach at the seat of injury. I therefore resolved to follow this course, and proceeded to do so on the 14th.

"The patient having been rendered unconscious, and placed on his right side, I thrust a bistoury into the tumour, over the situation of the gluteal artery, and introduced my finger so as to prevent the blood from flowing, except by occasional gushes, which showed what would have been the effect of neglecting this precaution, while I searched for the vessel. Finding it impossible to accomplish the object in

this way, I enlarged the wound by degrees sufficiently for the introduction of my fingers in succession, until the whole hand was admitted into the cavity, of which the orifice was still so small as to embrace the wrist with a tightness that prevented any continuous hæmorrhage. Being now able to explore the state of matters satisfactorily, I found that there was a large mass of dense fibrinous coagulum firmly impacted into the sciatic notch and —not without using considerable force—succeeded in disengaging the whole of this obstacle to reaching the artery, which would have proved very serious if it had been allowed to exist after the sac was laid open. The compact mass, which was afterwards found to be not less than a pound in weight, having been thus detached, so that it moved freely in the fluid contents of the sac, and the gentlemen who assisted me being prepared for the next step of the process, I ran my knife rapidly through the whole extent of the tumour, quickly turned out all that was within it, and had the bleeding orifice instantly under subjection by the pressure of a finger. Nothing then remained but to pass a double thread under the vessel and tie it on both sides of the aperture.

"The patient did perfectly well after this operation, with exception of complaining that he felt pain at the upper part of the thigh, for which I could not satisfactorily account until about three weeks afterwards, when I discovered a deep-seated abscess lying over the sciatic nerve. The matter having been evacuated by a free incision, there was immediate and complete relief, so that the patient was dismissed on July 29 perfectly free from complaint, and was soon afterwards able to resume his occupation."

Among the operations that Syme was the first to perform in this country were subcutaneous tenotomy of the sterno-mastoid for wry neck (1832); disarticulation of the clavicle for sarcoma (1841); and removal of the entire scapula without sacrificing the arm—an entirely original procedure (1856). He also introduced improved methods of excising the tongue for cancer; of restoring the nose by flaps taken from the cheeks; of reconstructing the lower lip by flaps taken from the neck; and of remodelling the nose in cases of lipoma nasi and "morbid expansion." In his operative work he always aimed at attaining his object by the most direct method and with the least complicated instrument. This led him to modify many of the operations commonly performed in his day with excessive elaboration and needlessly complicated appliances. As an operator Syme could not compete with his brilliant contemporaries, Liston and Fergusson. One of his assistants, Dr. Joseph Bell, whose own prowess with the knife gave him the right to criticize even his master, thus expresses the special character of Syme's method of operating:[90]

"Not naturally very dexterous, not even very powerful, . . . his operating was entirely devoid of flourish and dash. . . . He was not rapid, not very elegant. But on the other hand, he was absolutely free from fuss and hurry; all idea of self,

his own dexterity, his own appearance, his own comfort, was evidently banished when he took the knife in his hand. He thought of nothing but the patient, and the best—not the most rapid, not the showiest, nor the easiest—but the *best* way of relieving him. Having taken up his position by the table, he rarely moved from it, standing quietly, with very little movement even of back and shoulders, working almost exclusively with wrist and elbow. . . . His imperturbable coolness was contagious, and thus he was generally well assisted without noise, with hardly a word said on either side. . . . Probably no surgeon ever was so simple in his tastes and requirements as to instruments."

It is impossible to pass over without mention Syme's controversial tendencies, which in a curious way seem to reflect the defects of his qualities. Enjoying a clearness of mental vision that enabled him to see at once to the root of things, he had no patience with shallow minds or superficial thinking, and his remarkable gift of incisive language and caustic retort, when brought to bear on those with whom he differed, too often left a sting that rankled. A mere difference of opinion on a surgical matter was apt to develop into a bitter personal quarrel, in which the merits of the point at issue were lost sight of in a paper war of recrimination. To his obstinacy as much as to his

ingrained sense of right and justice may be traced some of the quarrels which had eventually to be settled at great cost to himself in the law courts. In one case, not content to abide by the decision of the jury, Syme carried on with the Lord Justice Clerk, who presided at the trial, an animated discussion on the laws of evidence in which, to the non-judicial mind, he seems to have had the best of it. It must be confessed that on more than one occasion his excessive solicitude for the honour and dignity of his profession led him to take action which in the eyes of the laity seriously compromised both.

Syme's pre-eminence in the surgical world, as well as his official position in the University of Edinburgh, entitled him to act as the mentor on matters relating to his own particular subject, but scarcely justified the jealousy with which he viewed the intrusion of specialists from other departments into his domain. His adoption of anæsthesia was delayed more because the discovery emanated from the obstetrical department than because he failed to appreciate its advantages; and the uncompromising opposition he offered to Simpson's acupressure method of controlling hæmorrhage had avowedly the same origin. It may have been that in the practised hands of such a master of his art as Syme, ligation and torsion met all his needs, but in its day it was recognized by many surgeons of distinction

that acupressure had merits. We cannot avoid the feeling that Syme's dramatic rejection of it by publicly destroying Simpson's pamphlet on the subject was based on personal spleen rather than on surgical principles. It has been said that "Syme was always right in the matter, but often wrong in the manner, of his quarrels," but this claim only contains sufficient truth to justify the making of an epigram.

For well over a quarter of a century Syme held a dominating place in the surgical commonwealth of Europe, and was acknowledged to be "one of its chief architects." There were "few advances in surgery that had not received some impulse from his indefatigable and vigorous mind." The last and the greatest advance to receive his imprimatur was that initiated by his distinguished son-in-law, Joseph Lister. In what proved to be the last clinical lecture he ever delivered, Syme spoke of the antiseptic system as the most important subject that had occupied the attention of the class, and as one "which, if it has not already done so, is certainly destined in no small degree to revolutionize the practice of surgery."

This was in 1868. In the spring of the following year he had an apoplectic seizure, which necessitated his resignation of the Chair. The few remaining months of his life were passed at his

suburban home at Millbank, where for thirty-six years he had found relaxation from the cares of his work in cultivating the rarest fruits and flowers, and entertaining his friends with simple Scottish hospitality.

On June 26, 1870, he died at the age of seventy-one, and his passing marked the close of the pre-Listerian era of surgery.

Let his successor in the Clinical Chair and the great apostle of the new era sum up his qualities:[63] "Mr. Syme may be said to have been a surgeon 'in all supreme, complete in every part.' In clear perception and luminous exposition of surgical principles, both pathological and practical, he stood unrivalled; yet he was equally conspicuous for the correctness of his diagnosis, his originality and ingenuity in device, and his admirable excellence in execution. His success was due not merely to his great intellectual gifts and manual dexterity, but full as much to his genial, sympathizing love alike for patient and student, his transparent truthfulness, and his exalted sense of honour. These noble qualities made him keen in the pursuit of his science, single-minded and earnest in the discharge of surgical duty, and influential for good in an immeasurable degree with those who came within the range of his personal teaching."

The passing of Syme marked the close of a

brilliant period in the history of surgery : the advent of Joseph Lister opened one still more splendid. In the radiant after-glow of Syme's fame the torch that Lister had lighted before he was called to fill the Chair of Clinical Surgery glimmered but feebly, yet ere long its lambent flame illumined the whole surgical firmament. That the light of Lister's genius shone at its brightest in her midst is the lasting pride of the Edinburgh School, but "many brave men lived before Agamemnon," and although we "are without a divine poet to chronicle their deeds," we would not willingly forget them.

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