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SIR WILLIAM MACEWEN

An Oration

BY

ARCHIBALD YOUNG

REGIUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF GLASGOW

*Delivered in the University at the
Commemoration of Benefactors
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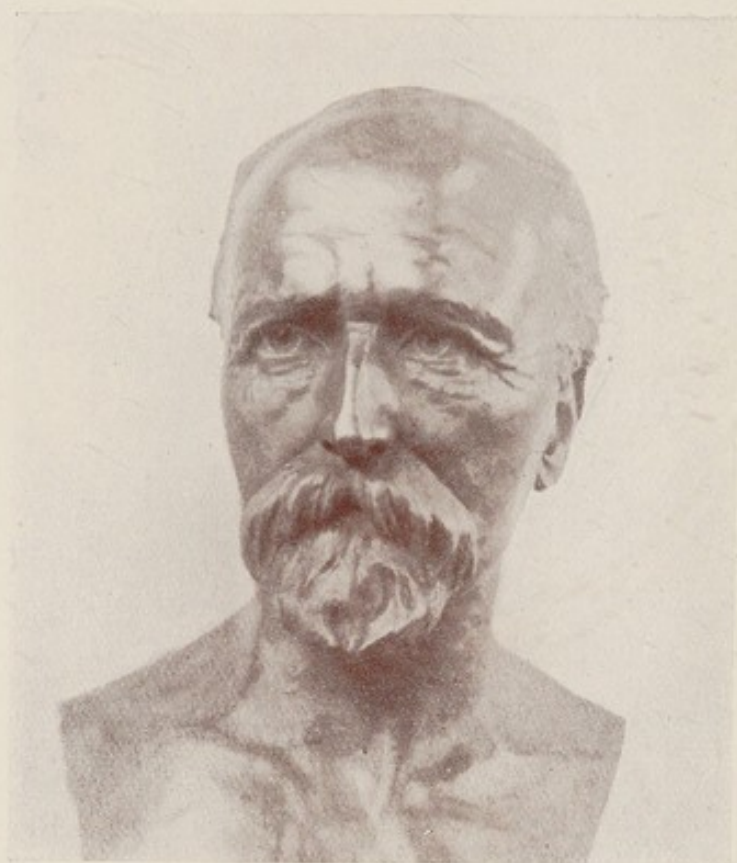
1926





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GLASGOW UNIVERSITY
PUBLICATIONS

IV

THE LIFE AND WORK
OF
SIR WILLIAM MACEWEN

PRINCIPAL SIR DONALD MACALISTER,
LADIES AND GENTLEMEN,

Through no wish of my own, but solely by the compulsion of the Vice-Chancellor, whose word within these precincts is law, I find myself in an unaccustomed position. I have the duty laid on me to present to you to-day a brief word-picture of the life and work of my great predecessor in office, Sir William Macewen. It is an honourable duty, which might well have been placed in more capable hands. If I fail in its proper execution it shall not be from lack of appreciation of the opportunities it affords. I crave your most tolerant goodwill, and your most lenient judgment.

It is probably known to you, that, according to the original plan, the place I now occupy should have been taken by one much better equipped to deal with the theme; by one whose almost unparalleled achievement in cerebral physiology, pathology, and surgery in recent years has made him, in my judgment, *the* man from all the world best fitted to appreciate adequately the work of Sir William Macewen, the pioneer in the modern development of cerebral surgery.

Professor Harvey Cushing, unfortunately, has not been able to visit Glasgow this year, and so it has fallen to me to be his substitute. I may be permitted, however, to tell you that he had wished very much to be present. He told me, in a recent letter, how great had been his desire "to pay tribute to the memory of that great man." "To have done what I could," he said, "in memory of Macewen's life and work would have been a tribute I would have been glad to pay." It is satisfactory, however, to think that we may yet look forward to the time when Professor Harvey Cushing may find it possible to be with us; to deliver, we hope, the Inaugural Sir William Macewen Memorial Lecture. We look forward to that event with eager anticipation.

It has come to be almost a convention in recent times, I understand, in examination tests on English literature, to ask the student to give a sketch or estimate of some well-known character of Shakespeare or some other great writer—let us say, of Rosalind, of Hamlet, of Falstaff, or of King Lear. The advantages of such attempts at character analysis, even their practicability, or justification, have been questioned—and not without reason. How is it possible, it has been said, and what possible value can there be in such efforts, to analyse what are obviously mere creations of the poet's brain, mere figments of his imagination? These characters are not persons; they may be personages; they never had existence. How is it possible then to make any estimate or assessment of their actions, feelings, motives? Much can be said in favour of such a questioning position. Why! the ancient Greeks knew better. The Greek dramatist did not attempt to depict his principal characters as if they were other than creations

of fancy. The figures of his creation wore masks, as if to emphasise the fact that they were indeed unreal images, whose characters and motives were incapable of appraisal in terms of actual personal attributes.

I can urge no such plea to-day regarding the task which has been set me. I have to present to you some kind of estimate, some sort of character sketch, of one who was indeed no figment of the poet's imagination, no creation of fancy, no unreal figure ; but one who in the life and work of his time stood forth a great figure, leaving an impress everywhere within his sphere of work, and helping to mould the science and the art of surgery, even better than he knew, along lines that have proved beneficial to humanity. To attempt a character sketch of such a man is no light task, but a task to be approached seriously and in a spirit of humility. In such a spirit I hope I have approached it ; others shall say whether my estimate is just.

I have been given as the title of my address " The Life and Work " of this great man, and perhaps I may be expected to say something first of all regarding his life—something biographical, something of his boyhood, his early training, his scientific development, his family life mayhap. If such has been expected of me, I am afraid I shall disappoint you. I propose to do no such thing, and for the reason that to my mind Macewen's life and Macewen's work were synonymous. It would be as true to say that his life *was* his work, as it is to say his work was his life. His whole life was work, and purposeful work. One often hears the phrase " putting in the time," or " passing the time." There is the French phrase "*pour passer le temps.*" Macewen could never have used such a phrase. I could not imagine Macewen

ever doing anything "*pour passer le temps.*" I think he must have been impressed, as so many of the world's greatest men have been, with the very meagre store of knowledge so far wrested from the book of nature, compared with the vast realm of the still unknown. My predecessor in this position of two years ago, Dr Alexander Russell, speaking of Kelvin, said that "Lord Kelvin, like Sir Isaac Newton, was impressed with the smallness of that which had been actually achieved, in comparison with what had been attempted. He thus pointed out the boundless unexplored fields which still stretch in endless vista before the scientific man." New discovery, no doubt, is ever being made, but, as Sir William Ramsay pointed out in his Commemoration Address on Joseph Black, "Every discovery of a new principle of research heralds a new departure." There is ever more to do; there are ever more problems to explore. I have quoted elsewhere a saying of Professor J. Arthur Thomson, taken from the Preface to his *Secrets of Animal Life*, "Nature so often tells us one secret in terms of another." This is very true: one might illustrate it by reference to many of the great discoveries of science, and it would be easy to demonstrate its truth in respect of many of the already partially solved problems of surgery. And just as truly as Nature may tell us one secret in terms of another so she may refuse to disclose one secret till another has been laid bare. I think that Macewen must have realised this, and he seems to have been actuated throughout his life by the determination, perhaps hardly formulated in his mind, but none the less implicit in his conduct, to devote his great powers unceasingly and without rest to making advance in orderly fashion along the line of progress.

I have been perusing recently a list of Macewen's published works. It is a remarkable list, though by no means complete. It comprises more than seventy separate contributions to the literature of surgery. When one comes to analyse the list more closely, mere surprise at the mass of writing turns to wonder; indeed to something more akin to reverence. For the greater part of the list is made up of papers and monographs of such importance, and representing such a mass of scientific research and investigation, as might have occupied the time and the energy not of one but of several earnest workers.

In addition to the many shorter papers, almost all of which have their own intrinsic value, and many of which stand out as remarkable records of original observation, there are the many longer papers, addresses, and lectures before learned and scientific societies, all of importance, and most of them striking some new and original note, or suggesting some new line of thought or of research. Nor does this end the list; there still remain the larger works, which, by their inherent merit, their scientific insight, and the irrefutable demonstration of their teaching, may be said to have established themselves as standard or classical presentations of the particular subjects with which they deal.

Macewen's treatise on *Pyogenic Diseases of the Brain and Spinal Cord*, and his works on *Osteotomy* and on *The Growth of Bone* rank already as classics. His *Atlas of Head Sections* constitutes a contribution to the surgical anatomy of the skull and brain which stands out as a permanent addition to scientific knowledge. In view of the cost of its production, it must have been as notable a failure financially as it is certainly an almost priceless contribution to Anatomy and Surgery. Its production

must have cost infinite time and infinite labour, such as would have taxed, almost beyond limits, the capabilities of most men. But Macewen, as the saying goes, "took it in his stride," and the *Atlas* appeared in the same year as saw the publication of his great work on *Pyogenic Diseases of the Brain and Spinal Cord*. Both of these were published only five years after the great Address on *The Surgery of the Brain and Spinal Cord*, which he gave before the British Medical Association, in Glasgow, in 1888. These five years must surely have been full years for Macewen and for those who worked with him; for even these publications did not represent all his interests during that period. He found time in the same period to publish a notable paper on the surgical treatment of Aneurysm—*On Aneurysm: its cure by inducing the formation of white thrombi within the sac* ⁽¹⁾; to contribute, to Christopher Heath's *Dictionary of Practical Surgery*, articles on "Diagnosis of Head Injuries; Fracture of the Skull; Encephalitis, Meningitis, and Abscess of the Brain; Compression of the Brain; Hernia of the Brain; Osteotomy; Grafting; Tracheal Catheterism" ⁽²⁾; and to lay before the Medico-Chirurgical Society of Glasgow, in his capacity as President, an exhaustive contribution to a Discussion on Anaesthetics ⁽³⁾. In this last contribution he embodied his own considered conclusions on the subject of Anaesthesia, discussed the conflicting claims of the advocates of chloroform on the one hand, and of ether on the other, described the dangers of general anaesthetics, and laid down, definitely and explicitly, his own views as to how these dangers might best be avoided or counteracted. The views he expressed then remained with him for the rest of his life, and the instruction which he gave to students on the subject of Anaes-

thetics may be said to have been enshrined in this contribution.

This must have been almost the busiest period of his life. During the later part of it I came for the first time into touch with him, and I was able to see for myself how little rest he seemed to take. His days were prolonged far into the nights ; he seemed to seek very little relaxation, except in a change from one direction of work to another. His week-days encroached upon his Sundays ; indeed Sunday was usually a " Field day," not only for himself but for all who were associated with him.

When one attempts to analyse Macewen's character, as it is presented in his life and work, there are a number of *traits* which seem to me to stand out specially clearly. The first of these which I would mention was *his infinite capacity for taking pains*. No amount of trouble was too great, if it meant the possible clearing up of a difficulty, or the confirming of an observation. No detail of description, provided it was apposite, was ever wittingly omitted by Macewen from a report, or from an argument.

Macewen was meticulous in testing his tools, as in verifying his facts. In his monograph on *Osteotomy* ⁽⁴⁾ considerable space is devoted to a careful description of the tools which he used, and which he recommended for use in the operation. And as one reads, one realises the endless pains Macewen took, in order to secure just the right degree of temper of his osteotome, consistent with the striking of a happy mean between too great brittleness and too great softness. There is the same indication in the story of his investigations into the problem of obtaining a method of preparation of Cat-gut, so as to ensure at one and the same time tensile strength, sterility, and the necessary degree of resistance to the absorbent action of the tissues. Macewen devoted much time to this.

research, and carried out many experiments; but neither time nor energy were grudged, for in the end he was able to elaborate a method for the preparation and disinfection of Cat-gut which approved itself to him, and which he employed until the last. His paper on *Chromic Gut: its Method of Preparation, and Behaviour in Living Tissues* ⁽⁵⁾ represents what was to him a final and completed proof of the efficiency of the method, and he employed Cat-gut so prepared and stored for the rest of his life; that is for a period of over forty years. He was as confident, at the end, of the efficiency of the method, as he had been in the earlier years. It may be not without interest to my hearers if I say that his successor in office has to-day the same confidence in the method of Macewen as its author had. In the course of my hospital work for the past twenty-five years I have used, continuously, Cat-gut prepared according to the Macewen plan, and I continue to use it with confidence and satisfaction.

Think too of the innumerable ox-bones upon which Macewen tried out his operation of Osteotomy before he finally assessed its applicability to the human subject. Again the *infinite pains*.

In a recent letter, Sir Charles Ballance made the following comment on Macewen's life and work: " 'Genius,' says Carlyle, 'means transcendent capacity for taking trouble first of all,' and Macewen's genius seems to me to have been founded on a cultivated ability and determination to carry on everlastingly in his labour for Surgery and for Surgical pathology. He began the day early, and finished it late. He seemed to me never to be idle."

"In Ruskin's *Crown of Wild Olive* ⁽⁶⁾ there is a sentence which seems to fit Macewen's habit of life and

manhood. Ruskin writes (the quotation is from an Address upon War to young cadets), 'Remember that all the duties of her children to England may be summed up in two words—industry and honour. I say first *industry*, for it is in *that* soldier youth are especially tempted to fail'":

"To Ruskin—Macewen as a *surgeon soldier* would have been a hero!"

I think this allusion is particularly apt, and fundamentally true.

There is a further *trait* that has seemed to me specially worthy of remark in Macewen's character, namely, his *faculty for taking full value out of every part of his work*, in whatever line his energies were employed for the time. There always seemed to present itself some problem on which he could exercise his active brain. During the earlier part of his career, he was for some years Police Casualty Surgeon in the Central Division of Glasgow, and he made observations there on such minor problems as presented themselves. Thus, the drunk man or woman offered an opportunity to study the behaviour of the pupil of the eye, especially in relation to the recognition of the effect upon it of alcohol. The result of such study is seen in a paper which Macewen published in 1879 upon *The Diagnosis of Alcoholic Coma* (7). In this paper there is discussed the differential diagnosis of states of coma arising from various injuries to the skull and brain, and their diagnosis from conditions of coma due to alcohol. The "Macewen Pupil" has been recognised since then as a definite sign of alcoholic coma, and the value of the paper in differentiating this from coma due to injury, direct or indirect, to the brain or its membranes, has long been established.

The many cases of wounding which were from time

to time brought to the police station, particularly on a Saturday night, afforded the opportunity to study and classify wounds, according to the type of instrument causing them, and the results of Macewen's study were embodied in a paper entitled *Wounds, in relation to the Instruments which produce them*, which appeared in 1876 (8).

About the same time a further paper entitled *Penetrating Wounds of Thorax and Abdomen* (9) appeared, and the observations upon which it was founded, though made in the routine work of a Police Casualty Surgeon, probably had something to do with the direction of his thoughts towards the study of certain problems of thoracic surgery, that were to take more definite shape in the later years. This paper was read before the Medical Chirurgical Society of Glasgow in the year 1874, five years after he graduated, and when he was only twenty-six years of age. It was one of his earliest efforts. Mr J. H. Pringle, one of Macewen's earliest assistants, pointed out, in the course of his memorial tribute to Macewen (10), that "the experience gained in connection with wounds of the thoracic wall would seem to have given him the first hint regarding his molecular cohesion theory, especially in connection with the pleural surfaces"—a theory that he was to develop at length over thirty years later. In 1902 he read a paper before the Nottingham Medico-Chirurgical Society on the *Surgery of the Lungs* (11). His Cavendish Lecture in 1906 was entitled *Some Points on the Surgery of the Lung* (12). In it he expounded at considerable length his views upon the cohesion of the pleural surfaces. He had satisfied himself of the truth of these views—it is doubtful if he ever fully convinced others. At anyrate much controversy on the subject was aroused. He returned to the

fray on the same subject in 1913, when he contributed to the Seventeenth International Congress of Medicine, in London, a communication on *Intrathoracic Surgery* ⁽¹³⁾. There would appear to be an almost melancholy interest in the fact that what was—so far as I have been able to ascertain—his last published paper, dealt with much the same subject. It was given in 1923, before the Australasian Medical Congress, during the World Tour which he made on behalf of the British Medical Association. The title of the paper was *The Physics of the Lungs and Pleurae* ⁽¹⁴⁾. Is it not a remarkable thing that this, Macewen's last scientific paper, appeared almost exactly fifty years after his paper on "Wounds of the Thorax," which was one of his earliest? What a gap in time, and "the wheel coming round full circle"!

A third *trait* in Macewen's character must be referred to. It is what I would call, without offence, *his self-sufficiency*. As Sir Donald MacAlister told us, in the Address which he delivered at Erskine on the occasion of the Unveiling of the Mural Wreath and Tablet in memory of Sir William Macewen ⁽¹⁵⁾, on 20th June, 1925, Macewen was not a "co-operator." He had confidence in his own powers, his own resources, his own judgment. He did not readily accept the judgment of others. He seemed almost to cultivate a spirit of distrust of anything that he had not himself put to the proof. This quality of his nature he displayed through the whole of his life, and it became more and more pronounced as he grew older. Tradition meant little to him: surgical dogma he accepted only where and when his own judgment was convinced, by his own observation and his own deduction. The same habit of mind was evident in his teaching of his students. He constantly advised the student to ask himself, with each fresh page he turned,

the question "Why?" He himself was for ever questioning accepted teaching and practice. As he counselled the student to observe for himself, to think for himself, to keep putting to himself the constant interrogative, so he was for ever questioning, observing, doubting, rejecting, making his own deductions. He had much sympathy with the attitude of "philosophic doubt."

Most teachers are familiar with the type of student who constantly "wants to know," who is ever making supplementary, and often awkward, inquiries. He has been dubbed "the anxious inquirer," but, however awkward his inquiries, he is often a most useful fellow. He stimulates the teacher, and often his fellow-students, to further thought, to a greater care in presentation of a clinical picture, to the avoidance of loose statement. Macewen, in my judgment, was the "anxious inquirer" *par excellence*. I believe that to his teachers during his undergraduate career he was indeed such an "anxious inquirer." He frequently waited behind after a lecture or demonstration, to question his teacher, or to argue with him on some part of the teaching that was not clear to his mind. Sometimes he was alone, sometimes he brought with him one or more of his fellows. The attitude of mind remained with him throughout his life.

But the habit of trusting as he did in his own powers had undoubtedly the effect of making him constitutionally incapable of the co-operation that most scientific workers find so valuable in the prosecution of orderly research. "Team work"—the team spirit—was not attractive to him, nor could he ever have remained for long as a mere member of any team. He would have "kicked over the traces" before long. He believed in doing things for himself, and in having things done for him by others

only where such others acted along the lines he, the Master, laid down. He was all right as the centre of a little group, a universe in miniature, of which he was the centre and controlling influence. But the work of the group must be his ; its line of action his ; its responsibility and its conduct his. He was indeed the typical individualist. In his little group he was supreme. He directed operations with skill. He had the faculty of getting the last ounce of work out of his assistant workers, because he gave the last ounce himself. He inspired his residents, his nurses, his students, his assistants, with something of the energy and enthusiasm which he himself possessed. And yet, one cannot but wish, sometimes, that he had been less of the individualist, more sympathetic to others engaged in scientific investigation, perhaps a little more complaisant, a little more yielding. One can only say that he had the defects of his great qualities. Even in respect of his attitude to his assistants, something of the spirit of co-operation would have been productive, I believe, of more good than harm.

About twenty-six years ago, I spent some time at the great Surgical School at Breslau. Von Mikulicz, another great man, was then at the height of his activity and fame, and he had around him a remarkable group of energetic and able younger men. Von Mikulicz was the head of the School, and his spirit inspired the School to such effect that there issued from it, during these years, such a mass of important records, papers, and varied publications, dealing with subjects of great surgical interest, as has hardly been equalled—probably never anywhere surpassed—in the same period of time. This great output of valuable work was the result of the highly developed “team spirit” that marked the whole working of the School. Hardly any of the papers that issued

from the Breslau Surgical Clinic in that period appeared under one name. Nearly all were issued under the joint names of Mikulicz and one or other of his assistants. Mikulicz lost nothing by having the name of an assistant associated with his own. Each of his junior collaborators gained enormously by having associated with his name that of his great Master. And the Breslau School of Surgery gained in prestige all the time.

It is pleasing to be able to say that in recent times we have seen something of this collaboration in Glasgow—most notable perhaps in the Department of Pathology. And the result is obvious. The Glasgow School of Pathology is world-famous. It may be said that so also is the Glasgow School of Surgery, and it is true. It could hardly be otherwise with a School that can show, on its roll of teachers, two such names as those of Lister and Macewen. I sometimes wonder, however, if it might not have been more famous still had Macewen been less of an individualist—more of the team-worker. Be that as it may, the fact remains that Macewen had the habit of working alone. He began his life work when knowledge of the bacterial agents in disease was meagre and unreliable, when there was a vast field of yet unexplored territory to open up, when it was necessary to break down much erroneous tradition, and when the older beliefs of the pre-Listerian days had not yet been set aside. In the beginning, he worked alone, largely because he was one of the few who from the first accepted wholeheartedly the teaching of Lister. And the opposition, which those who believed in the Master's teaching had to encounter, was stiff and fierce. He acquired then probably a habit of mind and of work that remained with him. As the late Dr M'Gregor-Robertson said, in the obituary notice which he contributed to the

Lancet ⁽¹⁶⁾—"Macewen had no charts of the region he set out to explore—no guide in the darkness he set out to illuminate. He had to devise his own methods; to forge his own instruments. He worked alone."

And even as he lived alone and worked alone, although surrounded by an always enthusiastic group of assistants, so also he lived alone in so far as his professional relationship with his fellows was concerned. I have said elsewhere ⁽¹⁷⁾ that Macewen "lived apart from the fraternity of his profession, and was always somewhat of a lone figure." The wonder of it is that, in spite of all, he made so deep a mark on the whole trend of surgery in Glasgow.

There is one characteristic of Macewen's work which calls for special reference, namely, its quality of *thoroughness* and *completeness*. His research was thorough, his observations were thorough, and his deductions were not hurriedly made. He was always in search of facts, and nothing was to him a fact till he had himself observed and proved it. He was careful that no misinterpretation of observed facts should lead him astray, and so, as has been remarked by Mr Pringle ⁽¹⁸⁾, "He was never in a hurry to publish. When he made his statement, it was final; he had the proof of its correctness."

This note of *finality* is peculiar to much of Macewen's work, and much of his writing. One would not suggest that it is possible ever to reach finality in research, and Macewen would have been the last man to make such a claim in respect of any part of his work; but one may say that Macewen explored every avenue of approach, considered all possible sources of error, made the most painstaking survey of literature having any bearing on the subject, and having at last dealt with every side of the subject and applied all possible tests, he was able to come to a conclusion which was to him final. This does

not mean that further research, even on the same line, was unnecessary. It might indeed mean, rather, that by the very establishment of this final position was rendered possible the making of a further step forward. It represented one more well-set rung in the ladder of advancing knowledge. See how this may be illustrated from his own development. I have referred already to his early observations regarding wounds of the thoracic wall, and to his later work on the Surgery of the Lung,—the second a natural development from the first. His classical work on regeneration of bone, work involving enormous observation and much experimental research, was begun in or about 1878, and was continued during the rest of his life ; but it is probably true to say that the paper which he published in the *Annals of Surgery* in 1887 ⁽¹⁹⁾ contains what may be regarded as his final conclusions on the rôle of the osteoblast and of the periosteum, respectively, in the growth of bone. He had proved conclusively, by the case which has become historic, in which he built up a new humerus by successive grafts of bone taken from six tibiae, that bone could in fact be transplanted, and live in its new site. We have here beyond doubt the initial step which led to the more recent advance in the direction of bone-grafting. Macewen led the way, surely and firmly setting that step, over forty-seven years ago. His initial work, too, on the *Surgery of the Brain and Spinal Cord*—a finished piece of work, if ever there was one—formed the starting or leaping-off point for the great advances of more recent years. Surely, looking back upon his life's work, he must have had much satisfaction in what he was able to accomplish, once for all.

No sketch of the life and work of Macewen would be in any sense complete did it not include some more particular

reference to three special aspects of his work. These are: *First*, Macewen's share in the development of modern Aseptic Surgery; *Second*, his work upon Bone; and *Third*, his pioneer work upon the Surgery of the Brain and Spinal Cord. I propose to say a little on each of these themes.

ASEPTIC SURGERY

It has been said that Macewen was fortunate in having begun his work exactly at the right time. Ballance has expressed something of the same idea in his obituary tribute to Macewen ⁽²⁰⁾, when he says "Macewen lived through the most glorious period of British Surgery." And indeed that is true enough. Lister's great discovery had just made possible the great expansion that the world was to see in the succeeding years, and the discoveries of Humphry Davy, Horace Wells, Morton, and Simpson with regard to the practicability, as general anaesthetic agents, of nitrous oxide gas, ether, and chloroform had but recently added further to the possibilities of surgical advance.

Without Lister's discovery, and the great boon of general anaesthesia, much of Macewen's work would have been impossible, and to that extent it may be admitted that Macewen was born at just the right time, when, as has been remarked by Patrick in his memorial tribute to Macewen ⁽²¹⁾ the possibilities of surgery "were opening up like great tracts of undiscovered country." But one must admit that Patrick is right in adding that "a genius such as his would have found undiscovered country to explore in any period."

Macewen played a great part in commending to his fellows the Listerian doctrine of wound infection and its prevention. He was from the first an ardent disciple

of Lister, and he endeavoured to apply the Listerian doctrine in his work from the earliest period of his career. His earliest papers show this, and in the Listerian ranks he was one of the doughtiest fighters. Here in Glasgow, as elsewhere, there was much opposition, and an exponent of the Listerian principles, fearless and persistent as Macewen, was a tower of strength to the cause. All through his life he preserved his admiration, and indeed his reverence, for Lister, and he gave a large place to the Listerian discoveries in the instruction he imparted to his students. In his systematic class at this University he devoted a considerable time each year to the bearing of Lister's work on the prevention of infection of wounds, but he was not for long satisfied with the simple doctrine of Antisepsis and of Antiseptic Surgery. He travelled farther than the Master. At an earlier period probably than any other surgeon in this country, perhaps even in any country, he had passed on to the development of what seemed to him the natural outcome of Lister's doctrines, namely the ideal of Asepsis and of Aseptic Surgery. Long before his fellows in this country, he had developed in his Clinic, and was teaching boldly to his students, what Sir Berkeley Moynihan has termed "*The Ritual of a Surgical Operation*," and his *Ritual* soon became strictly an aseptic one. During the last twenty-five years of his life, Asepsis and Aseptic Surgery constituted the ideal in his practice and teaching.

Certainly, in one sense, Macewen was fortunate beyond many of his fellows, and more fortunate than most of the younger surgeons of later times. He was appointed to the responsible charge of wards in the Royal Infirmary, Glasgow, at the extraordinarily early age of twenty-nine ; an age when, in the beginning of his manhood, he was full of vigour, and moved by great enthusiasm ; when he

had still the freshness of youth, and something of its boldness, even of its daring. To this extent he was indeed smiled upon by fortune. But even before he became a Visiting Surgeon he had begun to make his mark, and—with particular reference to what I have said regarding his attitude to the problem of wound infection and its prevention—he had already published several papers which proved how fully convinced he was of the surpassing importance of Lister's contribution to the science and art of surgery. I have referred already to the tribute to his memory made by M'Gregor-Robertson, and I venture to quote here, at some length, from the same article (²²), an account of a pathetic little monologue of Macewen, recalled from memory by M'Gregor-Robertson, of one of the last days of Macewen's life. I would quote it here with all reverence—it shows how near to Macewen's heart the subject was :—

“ On one of these recent days, the writer stood, alone in the room, by the bedside of Sir William, when he lay, high on his pillows, enjoying a brief respite of peace and comfort from suffering. Quite suddenly and spontaneously, in his ordinary quiet and deliberate voice, he began to speak of Mr. Lister. Lister had brought into his class one day a book, from which he read to his students extracts from a paper by Pasteur, in which the French chemist explained his view that putrefaction was due to the operation of living organisms. Lister had consulted an eminent chemist of the day as to the chemical means by which such organisms might be destroyed in living tissues, and the answer he had received was that he could be supplied with a long list of such substances, but what their effect might be on the tissues it was for the surgeon to determine ; but the chemist had added ‘ Try Carbolic Acid.’ These were days scarcely to be imagined or

conceived by the surgical student of the present day, and death following amputation after amputation, in melancholy and almost invariable sequence, was disheartening in the last degree.

“William Macewen, a junior student of surgery in the Royal Infirmary at that time, was a witness to these events, and a listener to these suggestions, and, one morning, more than usually depressed by them, he came out of the Infirmary, and sat down on a bench to consider by himself whether he could continue to pursue a study which could show only such results, and whether he should not abandon the study of medicine. An elderly woman of the domestic staff passed him as he sat in gloomy contemplation, and, struck by his aspect, stopped in front of him and said, ‘What’s makin’ ye sae sad the day, laddie?’ To which he answered, with a wave of the hand towards the hospital, ‘Who could help being sad at these things?’ The woman replied that it would be to more purpose to go back and try and mend them. The student went back, went back to a recent amputation, looked at the ligatures which projected in long ends from the wound. They looked dirty. He then had a look at the unused ligatures, which were made of hemp, and kept in a jar. They did not seem clean. He then asked, and obtained, permission to try if boiling would improve them. From the ligatures he passed to the needles, and, without further request, passed to the instruments, with increasingly appreciable results. But he could not so secure the cleanness of the hands of the attendants who handled them all.”

M’Gregor-Robertson makes the following further comment, which seems of interest as representing the impression made on his mind at the time:—

“The little monologue, of which the foregoing is but

the substance, was spoken in a clear quiet voice, without halt for fitting words, without delay of memory ; as if the times, the occasions, the incidents stood out clearly in the speaker's mind, as but things of yesterday. But the tale was unfolded with, for that speaker, a most unusual quiver of the mouth, and moisture of the eyes. It was as if the speaker's mind travelled back down the long trail which he had followed, and saw, far down amid the darkness and cloud of ignorance and noisome pestilence, the very spot and moment from which he had consciously and deliberately set forth on a determined road . . . the bitter, narrow path of commencement, full of hindrance and obstacles, the toilsome, slow ascent . . . until, at last, he lay at rest upon the shining peak . . . content. There was no exultation in the quiet voice ; no self-glorification in the calm narration ; only a fullness of content at the assurance that the task he had set himself to do, more than half a century before, had been accomplished."

It is certainly true to say that Macewen played a large part in developing the practical application of the Listerian doctrine. He was probably the first to use moist heat as a routine method in the sterilisation of operation and dressing materials. He experimented extensively, in the effort to obtain a reliable way of preparing and disinfecting absorbable ligatures, sutures, and drainage tubes. His whole operative technique soon passed from the purely antiseptic to the aseptic. I am old enough to remember how Macewen and his staff were, for some years, the only ones to clothe themselves in sterilisable white garments before entering the operating theatre ; and how they were held up to a good deal of ridicule for so doing. In time the prejudice was broken down, and everyone followed his example, but he was undoubtedly

the pioneer, though he did not always get the credit he deserved. The younger surgeons of to-day can hardly realise, as they carry out, unthinkingly, the routine of their aseptic ritual, how different were the conditions of barely thirty or forty years ago.

It was my personal privilege to have, at one time, a fairly close relationship with Macewen, and I can testify, from the recollection of many conversations, to the admiration and reverence in which Macewen held Lister. I cannot refrain, however, from mentioning a memorable incident, which now dates back thirty-two years. It has reference to the one occasion upon which I saw the great Lister, and when I had the very great honour of shaking his hand. The occasion is specially worthy of reference in virtue of the glimpse it afforded of Macewen's attitude to the Master.

Lister visited Glasgow in the month of May 1894, for the purpose of delivering an Address to the University Medico-Chirurgical Society. It was a long promised engagement. His subject was the simplification of antiseptic treatment. The Hall of the Union was crowded—as well it might be on such an occasion. In addition to students, there were present many members of the Senate, including Sir William Gairdner, Samson Gemmell, George Buchanan, Sir Hector Cameron, Joseph Coats, and Macewen. When Lister had finished, Macewen, as well as others, was called upon to speak. For a time he resisted the call. At last he rose, said a single sentence, and resumed his seat. It was this single sentence that expressed so clearly his attitude to the Master, and the effect of the single sentence upon the company of students was, I know, remarkable. It impressed me, and others who were present, as implying, in a way that nothing else could have done, the deep reverence of a great man

for an even greater. I should like to be able to quote that sentence with some degree of certainty, but unfortunately there exists some doubt as to what exactly Macewen did say. My own memory sometimes plays me strange tricks, and I am not sure that here it can be implicitly relied on. My impression still is that Macewen said something like this: "When the nightingale sings, all the other birds are silent, lest their feeble notes disturb its song." A colleague of my own on the Senate, who referred to the incident in my hearing last winter, and who was present on the historic occasion, as a very junior student, is of opinion that Macewen used the simile of the Contest of Song, where "after the great singer had sung, no one dared to follow on, lest he disturb the echoes of his song." A few weeks ago I put the question to another professional colleague, who was also present on the occasion, as to whether he could recollect what Macewen said. Without hesitation he replied, "Oh, yes. Macewen used that quotation from *Richard II* (Act V, Scene 3), 'As in a theatre, the eyes of men, after a well-graced actor leaves the stage, are idly bent on him that enters next, thinking his prattle to be tedious.'" This conflict of evidence rather disconcerted me, so I wrote to another friend who, I knew, had also been present—he had indeed been the proposer of the vote of thanks to Lister—asking him if he could possibly recollect the correct version of Macewen's sentence. I told him of the three versions I already had, and I said in my letter, "For Heaven's sake don't send me a fourth version." His reply was, "I am sorry to say that I am no use to you at all. As to what Macewen actually said, I can believe any one of the versions you give me. It is a striking illustration of the vagaries of memory as commonly met with in the analysis of evidence, that there are

three similes in the field—nightingale for you, Meister-singer for C——, and actor for X——. As two plump for song, I'd rule out X——. As between the two songsters, I am inclined to back your nightingale, for Mac was a great lover of nature, though a staunch Wagnerian as well." In any case, Macewen's reverence for the Master was such that, though, in his Address, Lister had said much with which Macewen was not in agreement—indeed a good deal which Macewen thought unfortunate, especially as it was being put before students by such an authority—he was yet able to conceal his chagrin, and to say nothing that might imply the slightest disrespect to, or even criticism of, the Master. Lister had been pleading for simplicity in the application of the principles of antiseptic surgery, and, perhaps unwittingly, reflecting on many who, like Macewen, had advanced further even than Lister had done along the road of natural development. No doubt Macewen felt that this was so, and I know that he felt also that Lister's address contained a good deal that might be misinterpreted, and that might seem to afford some superficial justification for relaxation in the scrupulous care that he was accustomed to urge on his students as essential in the preparation for, and in the conduct of, any aseptic operative procedure.

Sir William Gairdner on one occasion—I am uncertain whether it was at the Lister meeting—characterised the position of Macewen and those who followed him by using a parody of the well-known phrase "*Ipsis Hibernis Hiberniores.*" He altered it thus, "*Ipso Listero Listeriores.*" The application of the phrase to Macewen was undoubtedly an apt one, for Macewen, in his teaching and in his practice, did out-Lister Lister—in other words, he adopted the teaching of Lister regarding the causes of

Wound Infection, and the general principles underlying Antiseptic Surgery, but he went further, and strove towards the ideal of microbic exclusion, and the attainment of healing of wounds free from infection. It is certain that in his own practice he very largely succeeded in this attempt, but not without many struggles against prejudice, and against the inertia of the self-satisfied and of the ignorant. Aseptic healing of wounds became the rule in his wards, instead of a fortuitous happening, and in time the influence of established fact began to assert itself far beyond the more immediate ambit of his practice.

THE SURGERY OF BONE

In an earlier part of this address I have referred to some aspects of Macewen's work on Bone. It is necessary to make further reference to it, for it constituted a large and important part of his life's work, second indeed, only, in importance, to his work on the Surgery of the Brain and Spinal Cord.

I have thought sometimes that his work on Bone must have been nearer his heart than any of his other scientific interests, for he seems to have had his mind directed upon some aspect of it at nearly every stage of his professional career. The historic case already mentioned, in which a new humeral diaphysis was built up step by step by a series of heteroplastic transplants, was first operated on by him as far back as 1878 ⁽²³⁾, and he was able to follow out the after history of the case for over thirty years, so that in his final conclusions on *The Growth of Bone*, which he published in book form in 1912, he was enabled to give a comprehensive description of the process over that extended period of time, along with photographs showing the end result of this great physiological experiment.

It can hardly be disputed that to Macewen more than to any other we owe the development of the more recent advance in the practice of bone grafting. Transplantation of bone can hardly be discussed in any scientific assemblage without reference being made to Macewen and his work.

It is difficult to escape the feeling that, in his researches on Bone, Macewen's keenness was constantly whetted by the recurring controversy upon the rôle of the periosteum in regeneration of bone. He was himself the great protagonist for the view that regeneration of bone was the property of the essential bone cell, especially the active or embryonal form of this, the osteoblast. The volume referred to above, *The Growth of Bone* (²⁴), embodied the results of an inquiry which was admittedly "undertaken to test by direct experiment problems connected with the growth of bone." In the Preface he indicates that this inquiry seemed to him to be necessary "as a firm belief exists that all periosteum produces bone—such is the physiological teaching—many believing that diaphyseal bone could not be produced without periosteum, and once produced would die were the periosteum removed."

To many thoughtful observers the problem that Macewen set out to solve, the controversy that so intrigued him, and indeed his whole argument, were largely unreal, being based on the assumption of a much too literal and limited interpretation of the anatomical and physiological teaching of the day regarding the function and constitution of the periosteum. "The periosteum," said Macewen, "is a limiting and protecting membrane, of great use in physiological and pathological conditions. There are no data to indicate that it can of itself secrete or reproduce bone. It has no osteogenic function." He held

strenuously that in the activity of the osteoblast, and in it alone, resided the osteogenic property. He would not admit that the periosteum should be regarded as consisting of two layers—an outer largely fibrous and vascular, and an inner, containing in the meshes of an areolar tissue, the bone cells having osteogenic properties. “That deeper layer,” he would say, “is not periosteum. It is part of the bone.” Or, “these osteoblasts which you say may be found in the deeper layer of periosteum should not be found there normally. If you are able to find them there, they are out of their normal habitat, as the result of some abnormal process.” In any case the great periosteum controversy occupied Macewen much, both in argument and in experiment, through the greater part of his active life, and anyone who might be anxious for an argument could always be sure of a ready lure to draw him forth to battle.

Macewen's work on Bone, however, found a more useful field of application than that with which I have already dealt. The surgical treatment of bony deformities early attracted his attention. Almost from the beginning of his career, he turned his mind to the deformities associated with rickets, a disease particularly prevalent in Glasgow. From anyone moving about the city, especially in the poorer quarters, these deformities could hardly escape notice. Up to the time when Macewen began his work, no satisfactory method had been devised to deal with the gross deformities which were so prevalent. Macewen took up the work, directing his attention not merely to the surgical correction of these deformities, but to an inquiry into the cause of the disease. His first article on the subject, which appeared in 1878, that is, one year after his appointment to wards in the Royal Infirmary,

was entitled *Antiseptic Osteotomy for Genu Valgum* ⁽²⁵⁾. Other papers quickly followed, and Macewen pursued his observations and practice on a large scale, so that he was able in 1880 to publish in book form his monograph on *Osteotomy* ⁽²⁶⁾. At the time of its appearance he had operated on 557 limbs, in 330 patients. Of the 330 patients, 220 were affected with Genu Valgum—367 limbs; 110 patients had bow-legs, anterior tibial curves, and other tibial curves, and ankylosis of the hip and knee—190 limbs. These numbers did not completely represent the total number of Osteotomies performed, for in many cases multiple operations were required. The total number of Osteotomies actually carried out was in fact 835. It is not possible here to detail the important data presented by a consideration of this large series of cases, though these are given at length, and with detail, in the book; but it is worthy of remark that out of the whole list only three patients died; one from pneumonia contracted prior to operation, one from tuberculous meningitis, and one from diphtheria. Considering the fact that the great majority were dealt with in the very earliest days of the Listerian régime, such a result is remarkable, as is also the further fact recorded in the book, that, in the whole series, all the wounds healed without pus production, with the exception of eight cases. In only one of the eight did wound infection lead to serious trouble—surely a wonderful record.

The publication of this Monograph at once attracted widespread attention, and Macewen's operation of Supra-condyloid Osteotomy became ere long the operation of universal choice for the correction of Genu Valgum. Various other operative procedures had been devised, notably by Ogston of Aberdeen ⁽²⁷⁾, and by Chiene of

Edinburgh (²⁸). But these were not long to stand comparison with the operation devised by Macewen, whose book speedily took rank as a standard work, and was translated into every European language.

I have told elsewhere how remarkable a personal triumph Macewen achieved in connection with his work on Osteotomy (²⁹), but the story will bear repetition, not only in respect of the remarkable ascendancy achieved by Macewen, but also by reason of the graceful way in which other surgeons accorded to him and to his operation the credit which meant for themselves the abandonment of their own special operative methods.

The reference is to the Meeting of the Section of Surgery at the Congrès International des Sciences Médicales, held in Copenhagen in 1884, when there was a great discussion on the operative treatment of Genu Valgum. In this discussion, full and exhaustive consideration was given to the comparative results, and the respective merits, of the operations of Macewen, Ogston, and Chiene. The discussion took place four years after Macewen's book was published, so that Macewen was able to deal with larger figures than those in his book. He had prepared an elaborate statement, giving comparative statistics, on his own and other methods of operation. He submitted this at considerable length, and with convincing force. The following is a short summary of the discussion which followed. It may be found in the *Transactions* of the Congress (³⁰).

“Ogston said that the time had now come for formulating the conclusions which experience justified, concerning the merits of the various operative procedures. The statistics submitted by Macewen—though he (Ogston) had not yet digested them—spoke powerfully in favour of Macewen's operation. Ogston confessed,

without hesitation, that they corresponded with the conviction at which he, personally, had arrived.

“Ogston went on to say : ‘ Since Macewen’s operation was made public, I have given it a fair trial, generally performing it alternately with my own, often in the same patient treating one limb by Macewen’s method, and the other by oblique section of the condyle. I must say that I have never seen other than perfect result, in my own hand, from my own operation, but I know that this has not been the case with others, and I have therefore become satisfied that Macewen’s operation is the one best suited for the operating surgeon in general. It has the advantage of being applicable in young children, whose ossification has not been completed—that is to say, where oblique section by my method would be unwise. Mikulicz has shown also that Macewen’s osteotomy is the proceeding that best corrects the deformity, in accordance with the views regarding the situation of the disease that his investigations have established. I have, therefore, for some time, taught that Macewen’s is the best operation for genu valgum, and here, in this great Congress, before so many and eminent surgical authorities, I give in my adhesion to it.’ Surely a strikingly graceful admission, which must have required, for its making, a man of big and generous nature.

“Chiene, who followed, said that it was evident, from the clearly given statistics brought forward by Macewen, that the profession had given, by a large majority, the preference to Macewen’s operation. In these circumstances, Mr Chiene felt it his duty to state that he would try Macewen’s method on his return to Edinburgh. Mr Chiene congratulated Macewen on his great success.

“Bryant, of London, said that he thought the Section,

after hearing what had been said, would scarcely find it necessary to discuss further the relative value of the operations. They would all agree that Macewen's operation had been approved by statistics, and also by the fact that the authors of the other methods had now practically given them up. He must say, for himself, that he had used Macewen's operation many times, with very great success, and it was gaining ground where, previously, Ogston's operation had been practised. He was sure the Section would endorse what had been said about Macewen's operation being the best one; but he could not sit down without expressing the very great pleasure he felt at the manner in which the other gentlemen had given up what he might call their pet operations. Professor Ogston had done this with the greatest possible grace; and he (Mr Bryant) was sure the Section would award him, and the others, a vote of thanks for the manner in which they had acted."

It is surely given to few men to achieve such a complete international triumph. It settled once for all a matter that had been for some time the theme of much controversy, and it finally established Macewen's Osteotomy as the operation of choice for the treatment of Genu Valgum.

I have mentioned that Macewen's Monograph dealt also with the causation of the malady which led to the deformities, and it may be said that though his views on the etiology of rickets necessarily did not deal with, or even foreshadow, the more modern views on the biochemical and other agencies to which many now ascribe the production of rickets, yet his conclusions as to the influence of bad hygiene, the want of pure air, the absence of sunshine, the effects of chronic ailments, and perhaps of epidemic diseases acting during the growth period, are

still worthy of acceptance, even in the light of modern knowledge.

THE SURGERY OF THE BRAIN AND SPINAL CORD

It is probably true to say that Macewen achieved his greatest fame as the pioneer of Brain Surgery.

At the Meeting of the British Medical Association in Glasgow in 1888, he gave, by request, an Address which has become historic. It was so remarkable a contribution to surgical knowledge and surgical literature that it overshadowed the Address of the President of the Surgical Section. Comments in British and foreign medical journals of the period show what a sensation was produced throughout the world, and the references in the lay press were equally enthusiastic. I am just old enough to remember something of the sensation it caused, though my impressions at that time were derived solely from the lay press. The *British Medical Journal* referred to it as "In many respects the most remarkable contribution to surgical literature which the present day has produced." The *Journal* went on to give extracts from the address, singling out some of the most striking details, and continuing, "With these samples of Dr Macewen's address, our readers will not think us extravagant in saying that it marks an epoch in surgery, the initial stage of a branch of our art obviously destined to a glorious and beneficent future. All honour to the surgeon who has so ably, so successfully, led the way in this grand undertaking. After his address Dr William Macewen gave a demonstration of cases so remarkable that it alone would suffice to render the Glasgow Meeting memorable in the annals of Surgery. Many of the patients whose cases had been described in the Address were present." No wonder that at the close there was a scene of enthusiasm

such as lived in the memory of all who were privileged to be present. The Address was entitled *On the Surgery of the Brain and Spinal Cord* ⁽³¹⁾.

Thirty-four years later, when the British Medical Association again met in Glasgow, in 1922, Macewen—now its President—took as the subject of his Presidential Address practically the same theme as in his Address of 1888. The title of the Address on this occasion was *Brain Surgery* ⁽³²⁾. He was able to show how his observations and conclusions of so many years ago had stood the test of time, and he dealt at considerable length with some of the problems of further advance. That there was still great room for advance he was clearly convinced. He insisted on the importance of careful observation, and on the paramount necessity of attention to even the smallest details in the investigation of cerebral lesions. He had dealt with this aspect of the subject in his original address: he returned to it again, and illustrated what he had to say in this connection by many striking examples. His Presidential Address was in fact a comprehensive survey of his own work during the thirty-four years that had elapsed, but it was more than that. It was a masterly survey also, not only of the more recent developments in brain surgery, but of the great possibilities of the future.

It may be of some interest if we consider briefly what were the steps by which Macewen's great work on Brain Surgery came to be suggested and rendered possible. He has himself supplied the clue. In his original Address he said, "The full force and significance of the experiments of Fritsch and Hitzig in 1870 were not recognised until Ferrier's observations on the brains of animals (monkeys), undertaken to put to experimental proof the views entertained by Hughlings Jackson, were published in 1873.

Another link in the unity of the plan of creation was manifest, as, even in the higher and more complex brain of man, parts existed whose functions found homologous expression in that of the lower animals."

The sequence of events, looked at from the point of view of historical scientific development, may be summarised at slightly greater length, thus. I quote from my Presidential Address to the Royal Medico-Chirurgical Society of Glasgow in 1924 ⁽³³⁾ :

"The development of exact anatomy, the equally important development of the science of pathology, the progressive growth of physiology from Harvey (1578-1657) to Haller (1708-1777), the modern science of histology, which may be said to have been founded by Bichat, who died in 1802, at the early age of thirty-one, the work of Schleiden and Schwann on cellular physiology (1837 and 1838), the correlation of all these, and of many other factors, led directly or indirectly to the epoch-making advance of the science of cranial surgery in the latter part of the nineteenth century.

"The introduction of the ophthalmoscope, by von Helmholtz, in 1849; the first accurate proof of cerebral localisation by Broca, in 1861, when he demonstrated *post-mortem* a lesion of the third left frontal convolution, in a man who had not been able to speak for twenty-one years; the pioneer lectures of Hughlings Jackson (1835-1911) on the 'Diagnosis of Tumours of the Brain' ⁽³⁴⁾, Jackson's classical papers on 'Epilepsy' and on 'Affections of Speech'; von Graefe's demonstration of the association of Optic Neuritis with cerebral tumour ⁽³⁵⁾; the marking out, by Fritsch and Hitzig, in 1870, of certain centres in the brain by electrical stimulation ⁽³⁶⁾; the classical experimental work of Ferrier on the brains of monkeys, by which he proved beyond question the

localisation of function in the cerebral cortex ⁽³⁷⁾; his demonstration, at the International Medical Congress, 1881, of two monkeys on whose cerebral cortex experimental injuries had been inflicted, one monkey having a characteristic cerebral hemiplegia, while the other had lost its hearing: these finally proved beyond all doubt that cerebral function, and, indeed, the function of the whole cerebro-spinal system, were localised and localisable. Further experimental research, and the microscopical investigations and staining methods of Clarke, Marchi, Golgi, and others, but completed and amplified the evidence.

"These events, these signal discoveries—and only some of the most important have been recounted—serve as milestones in the path of the great advance in cranial surgery in the last century; or rather, they mark the great steps—to change the metaphor—in the ladder of growing knowledge which made possible the triumphs of cranial surgery of the period immediately following. They led up to the famous work of Horsley, Macewen, Bergmann, Keen, and Cushing. Horsley, who like Ferrier, had done much experimental work himself, in a paper read at Brighton in 1886 ⁽³⁸⁾, correlated the diagnosis in each case described with his experimental work on the monkey's brain. A year later he described ten cases—examples of cerebral surgery—and elaborated the importance of experimental physiology" ⁽³⁹⁾.

Macewen, in his great Address at Glasgow in 1888, "recounted a series of twenty-one cases of cerebral lesion, operated on with only three deaths. Apart from the success of the operative record, the outstanding feature of the Address and Demonstration was the account of the accurate correspondence of functional disturbance and clinical signs and symptoms with the operation findings."

From the above it might be thought, and it has indeed been suggested, that Horsley's work took precedence of Macewen's; that Macewen was not the pioneer. But this is not so, for, as Percy Sargent has pointed out (⁴⁰), "He has indeed been called the father of brain surgery, for his early work antedated by several years that of Victor Horsley. In an obscure corner of the *British Medical Journal* of 27th December, 1879, it is recorded that Macewen showed, before the Glasgow Pathological and Clinical Society, two patients upon whom he had successfully operated—in the one case, for hemiplegia due to a subdural haemorrhage, and in the other, for a tumour in the left frontal region. This second case is fully recorded in the *Glasgow Medical Journal* of September 1879. It concerned a girl, fourteen years of age, from whom a supra-orbital periosteal tumour had been removed twelve months previously. The tumour recurred, and convulsions appeared, which involved the right face and limbs. Macewen trephined in the left frontal region, and found the bone to be thick and soft, whilst beneath it lay a 'soft, flattened gummatous tumour' of the dura mater, similar to the tumour lying on the outer surface of the bone. The tumour was removed. No bad symptoms followed the operation, and the paralysis disappeared. It is almost certain that this tumour would now be recognised as a meningeal endothelioma." Sir John Bland-Sutton in his obituary tribute to Macewen and his work (⁴¹), in the same number of the *British Medical Journal* as Mr Sargent's article, referred to the celebrated case of Hughes Bennett and Godlee, and described how he met Macewen for the first time at a meeting of the Royal Medico-Chirurgical Society of London, on a "memorable evening, May 12th, 1885, when Hughes Bennett and Godlee gave an account of the

diagnosis, localisation, and removal of a tumour (glioma) from the cortex of the cerebrum of a man aged 25." He is almost certainly in error, however, in his further statement that "this operation really initiated brain surgery as it is accepted to-day." Bland-Sutton tells how "Macewen was invited to the Meeting, and contributed to the discussion some valuable observations relating to the operative treatment of intracranial abscess. Horsley was also present, and took part in the discussion."

Horsley and Macewen were undoubtedly great co-workers in the early development of Brain Surgery. In one sense they might be regarded as rivals, but this rivalry was less in their own minds than in the minds of their respective supporters. I am confident that each would have been concerned less in claiming for himself priority over the other, than in acknowledging the great debt that both owed to those who, like Hughlings Jackson, Fritsch, Hitzig, and Ferrier had made the way clear.

Great as was Macewen's work on the surgery of brain tumours, and their localisation, it is probably true to say that he stands out even more clearly as the pioneer in the diagnosis and surgical treatment of intracranial suppurative conditions. He was fortunate, at an early stage of his career, in being brought into association with the work of the late Dr Thomas Barr of Glasgow, particularly at the Ear Hospital, and, as always, he took full advantage of the opportunities presented, through this association, to study in all its bearings the manner of development of the different types of intracranial spread of infection from ear disease. This study became to him a matter of absorbing interest, which grew progressively as fresh light continued to be cast on the routes by which infection spread most readily, and on the

possibilities of its prevention and its surgical treatment. The association of Barr with Macewen—it is perhaps the only example in Macewen's career of something approaching the spirit of co-operation—was one of the most fortunate and most fruitful associations in the history of modern surgery, for it led to the laying of the ground-work of most of our present-day knowledge on the subject, and of present-day procedure in the operative treatment of Intracranial Abscess, Meningitis, and Sinus Thrombosis. Macewen's classic work on *Pyogenic Diseases of the Brain and Spinal Cord* was issued in 1893 (⁴²), and, as I have said, it remains a standard work to-day. In virtue of its style, the methodical recording of the cases described in its pages, the reliability of the observations detailed, and the comprehensiveness of its survey, it has few rivals in modern surgical literature. Taken as it stands, it suggests, better perhaps than any other of Macewen's writings, the scientific genius of its author. I think I am not seriously wrong in saying that the surgical teaching and practice of to-day, in respect of Pyogenic Intracranial Disease and its treatment, are based upon, and are indeed largely synonymous with, the doctrine first laid down in comprehensive form, in this great work.

Well might Sir William Osler say, (⁴³) “A most important, one might almost say essential, factor in the successful treatment of intracranial suppuration, is an intelligent knowledge, on the part of the surgeon, of the work and works of William Macewen.”

MACEWEN AS AN OPERATOR

A very brief reference may be made to Macewen's powers as an operator. One would not claim for him that he was an operator of heaven-born genius, or that

he was gifted with exceptional manual dexterity. He was, indeed, slower than many surgeons of his day. He seldom troubled himself, in his operative work, about the matter of time, and there were occasions when those who worked with him were inclined to regret that he would not hurry just a little. As Patrick⁽⁴⁴⁾ has said, he aimed "at thoroughness rather than speed and dexterity. It is not likely that he had any use for the American phrase, 'Get in quick, and get out quicker.'"

True it is to say that in certain branches of surgery, Macewen had perhaps less than the average facility, and less than the average success; but in those branches of the art which he had done so much to advance, and in which he was the unrivalled master, he was *facile princeps*.

To see Macewen do a mastoid operation; to watch him perform a radical cure of hernia, according to the method which he himself devised; to witness a Supra-condyloid Osteotomy of the Femur done by himself for Genu Valgum—was to witness a finished work of art—a thing never to be forgotten.

MACEWEN AS A TEACHER

The greater part of Macewen's active work of investigation had been carried out prior to his appointment to the Regius Chair of Surgery in this University. What one may speak of as his creative period had been passed before he turned his mind to the duties of a University Professor. To such a man, of course, even the active work of teaching could hardly bring to an end, or quench, the spirit of inquiry and investigation inherent in his being. Nor did it. He continued to the end imbued with the spirit of research, but with his appointment to the Chair he turned his mind definitely and seriously to the duties of teaching, and he was successful in making

a deep impression on the Teaching of Surgery in Glasgow, an impression whose influence was felt far beyond the University.

I have spoken already of the spirit of healthy doubt which he was accustomed to instil into the minds of his students, and of his constant injunction to them to put to themselves the perpetual interrogative. That may be said almost to symbolise his principle of instruction—to make the student think for himself. Macewen was not a great teacher of Systematic Surgery. His *métier* was as a teacher of Clinical Surgery. I have heard him say, long ago, that it had been his ambition to establish a great Clinical School like the School of the great Kocher of Berne. And indeed, to one who, like myself, had the privilege of seeing both of these men engaged in the active work of clinical teaching, the similarity of method was very notable. Each was accustomed to go very fully into the differential diagnosis of his cases, in the presence of large classes of students. As each case was dealt with, two or three students were selected. They were brought down to the floor of the classroom, and were taken very closely over the details of the case, being quizzed often somewhat rigorously, but seldom unmercifully, by the Chief. All the most likely possibilities were explored and argued out with the Chief, in the presence of the class—to the interest, and often to the amusement, of the latter, but certainly also to their enlightenment—until, by a process of exclusion, the most likely diagnosis was arrived at. Perhaps one should say that, at the conclusion, it did not always happen that Macewen would declare his own diagnosis in the case. One was often left in doubt as to what Macewen's diagnosis actually was. In this respect Kocher was different. He was accustomed to declare his opinion in the end. In the case of Kocher,

then followed the inevitable question—" *Was sollen Sie thun?* " Macewen often left this out. He was more concerned to show the student how to arrive at a diagnosis, than in forcing from him a declaration as to treatment. But, in any case, those mornings in the Clinic were unforgettable, and Macewen's students had certainly little excuse for failure to become proficient in the art of diagnosis.

I have endeavoured to indicate that Macewen did all in his power to implement the duties of his Professorial Chair. He put those duties always first. He spent much time, and expended much energy, in preparation. He was accustomed to take great trouble in the construction of models and diagrams.

He had strong opinions as to the proper method of training the young surgeon. He viewed with disfavour any attempt to assimilate the methods of the Scottish schools to those which have been traditional in the great English schools, and he opposed strenuously any attempt to graft the English tradition in teaching upon that in force here. He was a strong protagonist for the teaching of Operative Surgery, as a part of General Surgery, and he carried his views triumphantly to success in this direction. He succeeded eventually in obtaining the institution of a well-equipped department, for the prosecution of the practical part of his Operative Surgery Course, as well as for the purposes of research. I remember hearing him address the then Inspector of Anatomy—at a time when the supply of material for use in the Operative Surgery Class had become much restricted, and when it was being suggested that the claims of this department should give place to those of the Anatomical department—in these words: " But, Sir, surely you do not wish to reduce the Glasgow School of Surgery to

the level of the X—— Schools? ” This question may be taken as epitomising his aspiration for the School of Surgery of which he was the responsible head. “ *ἀείν ἀριστεύειν* ” — “ Ever to be the best.”

MACEWEN AND HIS ASSISTANTS

Ruskin has said (⁴⁵), “ And the first duty of every man in the world is to find his true master, and, for his own good, submit to him ; and to find his true inferior, and, for that inferior’s good, conquer him. The punishment is sure, if we either refuse the reverence, or are too cowardly and indolent to enforce the compulsion.” Macewen held in high reverence his great Master. Equally he compelled the acquiescence, and the service, of those who were his students, his nurses, his house-surgeons, and his assistants. He exacted obedience, and he showed little consideration for anyone associated with him whose service was not scrupulously loyal. He habitually seemed to move on a plane of his own, and he seldom unbent. A few of us, who were specially privileged to see him in a rare moment when he did unbend, treasure the experience in our memories.

The family life of such a man—indeed of any man—ought to be sacred, and one would not lightly intrude upon it ; but I cannot refrain from mentioning one memory that I have of an occasion when I was privileged to see Macewen in the midst of his own home life. During his busiest period, many of us used often to wonder whether indeed he had anything at all in the way of home life, as we understood it. He must have been little at home. Most of his days, and much of his nights, were occupied with work at the Hospital or in the Laboratory. Yet he was able to say, on the occasion of the complimentary dinner to which he was invited at the time when he

received his knighthood, in 1902, that he had drunk deep of the cup of domestic happiness. The memory that lives with me still, after over thirty years, is of an occasion when I was invited, along with a number of other senior students, to dinner at his house. After dinner, when we repaired to the drawing-room, Macewen entertained us, and his family, by reading—for the special benefit, no doubt, of the youngest member of his family, who was perched on his knee during the reading—a fairy tale, translated, I think, from the Norwegian. Those who, like myself, had been accustomed to look up with awe to Macewen as we saw him in hospital, could not fail to be struck by the apparent incongruity of our conception of the great man with the spectacle we had of him reading a fairy-tale to a small child seated on his knee.

Macewen was a great man—one of the world's great men. But like many great men, he was not without the defects of his qualities. Job has said (xxxii. 9) that "Great men are not always wise." And of no one probably is such a saying more true than of Macewen. He failed just where he ought to have succeeded. He earned respect, he excited admiration, in virtue of his energy, his industry, his originality of thought, his brilliant research. He kindled in his students and in his assistants something of the spirit of investigation with which he was himself so richly endowed. It is extremely doubtful, however, if he ever could be said to have gained—or even if he ever desired to gain—the affection of those who were his most loyal helpers. Many of us, who were brought into close personal relationship with him and with his work, often felt this as a defect in his quality which was to be regretted, all the more that such affection could so easily have been his. Macewen would have been none

the less great, but surely greater, had the universal admiration and respect accorded to him been supplemented by a universal feeling of affectionate regard.

I had occasion to speak some time ago to a friend whose opinion I value, regarding the place which Macewen might be held to occupy in respect of his personal qualities, in comparison with Lister and Paget. This friend, whose name, for obvious reasons, I withhold, said, "I had the privilege of knowing well both Lister and Paget. Macewen did not reach their level, I think, though he was a great man. When I met Lister or Paget in consultation, or when either of them was examining a microscopical specimen of mine, they always gave me the impression that they desired to learn from me! Now, this appears to me the ideal way of encouragement for a really great man to treat a very junior person belonging to the same profession. I may be wrong, but I cannot visualise Macewen acting in this way."

But these defects serve only to bring into more marked relief the greater qualities of the man whose genius was dedicated for so long to the service of this University, and of the great Surgical School of which Glasgow is proud.

MACEWEN AND THE UNIVERSITY

In the long and glorious record of this University are inscribed the names of many famous sons; of many who have done notable work for the advancement of knowledge, and for the benefit of the human race. The Professorial roll of our Alma Mater has names almost too numerous to mention of men who, in their day and generation, have done much to advance her efficiency and repute. Amongst this long and distinguished roll, few names can outshine those of the great Lister, and his almost equally great disciple—Macewen.

A good many years ago, in writing for the *Glasgow Medical Journal* a short Memorial Sketch of von Mikulicz (⁴⁶), I told the story—culled from the columns of the *Frankfurter Zeitung*, 17th June, 1905—of the great Billroth, who when overwhelmed by patients seeking his professional advice and aid, some of whom came from Krakau (where Mikulicz was then Professor of Surgery), turned on them and said, "Why do you come to me? Have you not Mikulicz in Krakau? He understands his business quite as well as I, and operates still better." There, surely, was generous tribute from great master to great pupil. I am reminded of this tale by the following story recently related by one who used to be well known in Glasgow: "A good many years ago I met five Englishmen on the steamer between Hamburg and Leith. They had graduated in Medicine in London, and had been afterwards in Berlin with Professor Bergmann, for a session of post-graduate study. When they parted from Bergmann he said to them—'If you can spare the time, I would advise you to go to Glasgow, to Professor Macewen, for a session. Afterwards, no man can teach you more.' " There, surely, was generous tribute of a great surgeon to a great international rival.

Truly, in the possession of Macewen, this University and this city had one whose fame was world-wide. His clinic was visited by surgeons from all the world, who came to see his work for themselves, and to listen to his words. At one time, indeed, he was almost better known abroad than at home—such is the proverbial fate of the prophet. It was certainly so in his case.

Abroad, his name and fame were well known. His name was one to conjure with. When, in my earlier years after graduation, I was able to visit a number of the most famous continental Clinics, a card of introduction

from Macewen did much to smooth my way. His name was a sort of "Open Sesame" everywhere. Then it was that I realised, if never adequately before, how big a man we were privileged to have at the head of the Glasgow School of Surgery.

I have sometimes wondered whether Glasgow and this great University have ever fully realised how great a privilege it had in the possession of Macewen, or how nearly, on more occasions than one, they came to losing him. It is no secret that Macewen was invited, on several occasions, to accept appointment elsewhere—notably when he was urged very strongly and persistently to go to the great School of the Johns Hopkins University at Baltimore. All kinds of lures were held out to him to induce him to go, but he declined, and persisted in his decision to remain in Glasgow.

The story of this attempt to procure Macewen's transference to the newly established School at Baltimore, and of the persistence of his refusal, is told in an initialled memorial contribution in *The British Medical Journal* of date 29th March, 1924. The following is a brief outline of it: "When the Johns Hopkins School was being established, those in control searched the world for men of outstanding ability, in research or in teaching capacity. Macewen was invited, but declined appointment. It was made clear that salary was no object, and that a great practice awaited him. He declined. He was told that the surgical wards to be built would be erected to suit his wishes. He still declined. He was then invited to bring with him, up to any reasonable number, assistants and nurses. Still he declined. Finally, he was invited to take a long holiday, to come over to Baltimore, and, incidentally, to advise about the establishment of the new School, suitable remuneration being promised. Even

this attractive offer failed to induce him to leave Glasgow, and that was the end of the project " (47).

This invitation, which could hardly fail to be a considerable temptation, came to Macewen about the year 1890, just when he was busy with his great work on *Pyogenic Diseases of the Brain and Spinal Cord*, and with the preparation of his *Atlas of Head Sections*, to which reference was made in the earlier part of this Address. It came, that is, during the extremely busy five years following the delivery of his Address on *The Surgery of the Brain and Spinal Cord*. No doubt he felt that it was impossible for him to interrupt his great work at such a time.

One cannot help being reminded of Nehemiah's reply, to those who urged him to go down to commune with them without the wall which he was engaged in building : " And I sent messengers unto them, saying, I am doing a great work, so that I cannot come down ; why should the work cease, whilst I leave it, and come down to you ? " (Nehemiah vi. 3).

Surely Baltimore's loss was Glasgow's gain.

In the words of the editor of *The Medical Journal of Australia* (48), speaking of Macewen : " Great men are remembered more by the fruits of their work than by monuments erected by their contemporaries."

So we remember, with gratitude, the life and work of William Macewen. The fruits of his work are with us, and are known to you. I, his humble successor, commend to you to-day his great memory.

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