Henry O'Neill (1853–1914)

President of the Ulster Medical Society 1891–92

Presidential Opening Address
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Gentlemen, – I sincerely thank you for the honour you have conferred upon me, by electing me President of the Ulster Medical Society for this year. When we think of the names of my worthy predecessors in this chair and the good work they have accomplished, we may be justly proud of the share this Society has taken in advancing the science and art of medicine and surgery. While feeling proud of our past successes, our duty is to carefully study the important advances that are being made by the foremost men in the surgical and medical world, and strive to keep in line with them. At present, we, as surgeons and physicians, are chiefly concerned with the cure of disease, but we are rapidly approaching the time when we shall become health officers, our duties then being to prevent rather than cure disease.

During the past ten years bacteria have come to be looked upon as playing a most important part in the cause of disease and fermentation. In consequence of this, bacteriology has been raised to the position of a science. The growth of this science went on slowly for a long time, and the study of bacteria remained chiefly in the hands of botanists. Occasionally scientific medical men considered there was a casual relationship between the growth of certain bacteria within and without the body, and the etiology of certain infective diseases. During the last ten years, because of the great improvements that have been made in the methods of cultivation of these organisms, and especially of obtaining pure cultures, that is, cultures which contain a single species of organism only, most valuable information as regards the function and life history of these small specks of vegetable protoplasm has been rapidly accumulated. Pasteur's marvellous observations on yeasts first opened up the way for future workers. The organisms that have been found in certain diseases have been identified and classified. Their methods of propagation and the channels by which they are conveyed from one host to another have been determined, and the whole subject has been so prepared, by such men as Pasteur, Chaveau, Lister, and Koch, as to enable them to place before the world theories of the utmost importance. To Lister is due the chief honour in this department of science for the great work he has done in the field of antiseptic surgery, by the evolution and perfecting of which he has done more to relieve the suffering and to diminish the mortality in surgical cases than has been accomplished by any other surgeon during the last century.

Tuberculosis, one of the most common and fatal diseases not alone in Belfast, but in Great Britain and the whole of Northern Europe has now been proved to demonstration to be due to the presence of a specific micro-organism – the tubercle bacillus – first discovered by Koch in 1882. After this important discovery the pathology of tuberculosis underwent a complete change. Tubercle occurring in any tissue of an organism must now be considered as a specific disease, the bacilli as the direct cause of all the morbid changes, and their presence as the certain evidence of the disease. By recognising the nature of tubercular disease in the joints, glands, or skin in an early stage, it is now possible by adopting proper treatment to arrest it. In the early stage of joint

disease the morbid action is often localised, and therefore arrest is at least possible. Arthrectomy is now performed in joint disease in suitable cases, while the synovial membrane is alone involved, to prevent the disease extending to the articular ends of the bones. When tubercular disease extends to the ends of the bones entering into a joint, the more serious operation of excision or amputation may be required to prevent the disease from infecting the lungs and glandular system, and causing general tuberculosis and death. With the general treatment of tuberculosis in patients we are all familiar, such as seeing that they have good food, warm clothing, and the enjoyment of fresh air and sunlight; but in the case of patients suffering from tubercular disease of joints especially of the hip, knee, and ankle – the most common seats of the disease in children and young adults, who have suffered from synovitis of these joints – it was almost impossible to permit them to enjoy the fresh air and sunlight until the late Dr. Hugh Owen Thomas, of Liverpool, by his untiring genius, invented and perfected his hip and knee splints. By means of these splints the joints can be kept steady and firm. Concussion or friction of the joint is prevented, and, therefore, patients while wearing them can enjoy exercise in the fresh air with perfect comfort and safety. Many valuable lives have been saved by the use of these splints.

Many theories have been advanced to explain why tuberculosis is not even more general than it is when we consider the great abundance of tubercle bacilli which is known to exist around us, and especially in close, badly ventilated rooms. It is a wonder that any one is left to even study this subject, but with the bane, nature has provided us with an antidote. And the antidote for tubercle bacilli according to Metschnikoff, of the Pasteur Institute in Paris, is produced by the leucocytes and other cells, named by him Phagocytes, and the process by which these cells remove dead material and destroy or digest pathogenic micro-organisms he describes as Phagocytosis. The leucocytes are called mikrophagi, and the fixed tissue cells, which are capable of performing the same function, makrophagi. Microbes, pigment granules, and fragments of tissue gain entrance into a cell.

The cells which are known to possess phagocytic properties are the leucocytes, mucus corpuscles, connective tissue corpuscles, endothelia of blood vessels and lymphatic vessels, alveolar-epithelium of the lungs and cells of the spleen, bone, marrow, and lymphatic glands. Metschnikoff first studied phagocytosis in the tail of the tadpole, and found the separation of this organ, at the time this animal is developed, is accomplished by leucocytes. In the daphnia, the common waterflea, he studied the destruction of a fungus with which these insects are liable to be infected by the mikrophagi. When phagocytosis proved successful he observed the destruction of the fungus in the interior of leucocytes; on the other hand, when the fungi were present in such large numbers that the leucocytes were unable to destroy or digest them the daphnia died. Next he investigated phagocytosis in a number of diseases – erysipelas, anthrax, relapsing fever, and tuberculosis.

In erysipelas the cocci are first attacked by the leucocytes filling the lymph spaces, and, later, by the fixed connective tissue cells. In the path of destruction he saw leucocytes loaded with cocci, the latter showing various stages of dissolution. In fatal cases of erysipelas the streptococci multiplied with such great rapidity that the phagocytes were unable to cope successfully with the disease. At the International Congress of Hygiene, held in London (1891), Metschnikoff gave interesting demonstrations on this subject. This doctrine of phagocytosis is strongly opposed by Holmfeld, Bitter, Prudden, and Nuttal. Osler, in a recent paper, gives the result of his own observations on the phagocytic action of cells. He shows very clearly how minute foreign particles are eliminated by means of the phagocytic action of the cells. Phagocytes are scavengers, which remove foreign dead particles from the tissues. Metschnikoff believed that the destruction of micro-organisms in the interior of phagocytes was an active process, and that the protoplasm had a sort of digestive action upon them. To prove the correctness of this supposition he made some experiments with the bacillus of tuberculosis. He injected a pure culture of the bacilli into the subcutaneous tissue of white rats; and, later, produced artificially suppuration at the seat of injection. Two months later he found bacilli in the pus-corpuscles in an unchanged condition, and without having lost their power of reproduction. As in other experiments he had witnessed the destruction and disappearance of the same bacillus in living cells, he concluded that phagocytosis is an active process which can only take place in a living cell, and is suspended with the death of the cell. There are few at this time who regard the destruction and disappearance of microbes in phagocytes as an act of digestion. If, however, microbes in the interior of phagocytes are rendered harmless, or disintegrate, or disappear, this fact is an important one, and it is immaterial in what way this result is obtained,

whether the microbes are digested by the protoplasm or whether some chemical substance in the cell body exerts an inhibitory effect upon them, or, finally, whether for want of proper nourishment they are starved. The results of experimental research have furnished positive evidence that infective processes terminate most favourably where the conditions described as phagocytosis are accomplished most satisfactorily.

When the struggle between a microbe and a phagocyte turns out in favour of the latter the microbe does not multiply in the protoplasm, or ceases to do so before the protoplasm is destroyed; and as the microbe cannot leave without dissolution of the cell it remains within its narrow confinement, and is destroyed either by some as yet unknown chemical substance or dies from starvation: in either event the vitality of the cell is not impaired, and the microbe disintegrates and disappears. If the conditions for the growth and development of the microbe in the protoplasm of the cell are more favourable intracellular multiplication of the microbe takes place, the ptomaines which are eliminated produce coagulation necrosis in the protoplasm, the cell disintegrates, and the intra-cellular culture is liberated in an active condition. In cases of unsuccessful warfare of the phagocytes against invading micro-organisms the mechanical obstruction composed of emigration corpuscles and embryonal cells is broken down, and the rapid increase of micro-organisms at the seat of inflammation gives rise to extensive local and often general infection. Practically, it can be said that all therapeutic measures which influence favourably the process of phagocytosis are, in the broadest meaning of this word, calculated to exert a great influence in arresting or limiting infective processes.

KOCH'S TUBERCULIN.

During the past year we have seen the rise, progress, and fall of Koch's Tuberculin, and those of us who have used it know something of its active therapeutic action, which in delicate patients can produce the most serious results. Still it is undoubtedly a valuable remedy if it can be so purified as to remove from it the excessive heat-producing agent. Dr. William Hunter, in a valuable paper published in the *British Medical Journal* of July 25th, 1891, gives the results of carefully conducted experiments, intended to show the composition and value of tuberculin as a therapeutic agent when freed from its dangerous elements. I had the opportunity recently of seeing his work in this investigation in the laboratory of the Royal College of Surgeons, London. Koch's tuberculin is a glycerine extract of pure cultivations of the tubercle bacillus. The remarkable properties possessed by it are, according to Koch, due to one active principle in such small quantity as to constitute probably little more than one per cent. of the whole, and he describes it as "a derivative of albuminous bodies."

ACTION OF TUBERCULIN.

Koch states that the various substances present in tuberculin other than its active principle have no action at all on the organism. Since all the activity of tuberculin is on this view dependent upon the presence of this one body, it is only fair to conclude that this activity must show itself in very different ways, (1) partly by inducing local inflammation around tuberculous areas, (2) partly in producing a general constitutional disturbance the chief feature of which is fever; and (3) partly in favouring the growth of the tubercle bacilli, and thus favouring the recurrence of the disease. These three chief effects of tuberculin have been established by careful clinical and pathological observations. They vary in their character and intensity according (1) to the extent, character, and seat of the tubercular lesion, and (2) individual idiosyncrasy.

LOCAL EFFECTS.

Both the local and general action of tuberculin brings with it its own peculiar dangers. The dangers connected with its local inflammatory action are those incidental to the softening and absorption of tuberculous tissue, more especially the danger which Virchow's observations, fully confirmed as they are by clinical observation, have conclusively proved to be a real, although a rare, one – namely, the increased activity and further spread of active bacilli.

GENERAL EFFECTS.

The general effects include, in addition to fever such general symptoms as headache, drowsiness, feelings of sickness, and *malaise*, aching pains in the back and loins, rigors, and occasionally severe depressent action on the heart. These symptoms indicate the action of an albuminous poison, especially the nausea, aching pains in the back, and weak action of the heart. These symptoms are very similar to those which are occasionally seen to follow the intravenous injection of defibrinated blood – blood containing various albuminous bodies, including certain of Wooldridge's "tissue fibrinogens." The fever is the most constant and characteristic phenomenon next to the local inflammation. Koch attached great importance to the fever, and the main details of his treatment being regulated by him according to its presence or absence. Dr. Hunter

began early in January of this year to study the composition and therapeutic value of tuberculin, and amongst other things to ascertain how far it was possible to eliminate all substances having an injurious action and thus to obtain its remedial without any of its injurious effects.

SUMMARY OF RESULTS.

In their order of importance, as well as amount, the chief substances present in tuberculin are, according to Dr. Hunter –

(1) Albumoses.
(2) Alkaloidal Substances.
(3) Extractives.
(4) Mucin.
(5) Inorganic Salts.
(6) Glycerine and Colouring Matter.

The only substances present in tuberculin with which its active properties could be connected were albumoses, organic bases of alkaloidal nature, and probably various extractives. His next object was to ascertain to which of these bodies tuberculin owed its characteristic properties. Observations on this subject were made first on mice and guinea pigs, and being satisfied that the various modifications of tuberculin were physiologically active, he suggested to Professor Watson Cheyne that the results obtained on animals might be equally successful in the treatment of tuberculous patients. Mr. Watson Cheyne agreed to this, and since the end of April has carried out the treatment with this modified tuberculin in King's College Hospital, and in Paddington Green Children's Hospital, using it in place of the original tuberculin. The patients treated have been suffering from lupus, joint, and bone disease. Mr. Watson Cheyne gave the result of his experience of the use of modified tuberculin at the last meeting of the British Medical Association, at Bournemouth, and stated he could only give a provisional opinion because the time is too short since the treatment of the cases to judge whether the improvement may be permanent or not, although several cases of lupus and joint disease improved considerably under the treatment adopted. He considers in surgery this treatment will probably take a place secondary to the more rapid and thorough operative measures.

Although, up to the present time, Koch's tuberculin has not been very successful in the treatment of tuberculosis, yet the valuable work he has already accomplished in the study of tubercular disease gives us the hope that his labours towards perfecting the cure of this terrible disease will ultimately be crowned with success. On October 22nd, 1891, Dr. Koch published a report of tuberculin, in which he states that by adding to tuberculin alcohol of 60 per cent a deposit is formed, which Koch considers to be as nearly as possible the active principle of tuberculin. In therapeutic action this purified tuberculin does not differ materially from the original preparation.

Closely connected with the study of the science of bacteriology is the study of the treatment of wounds so as to secure immediate union. Pasteur by careful experiment proved (1) that germs were the cause of fermentation in diseases, (2) that each fermentation was due to the specific action of a definite organism. Lemaire found that the addition of a small quantity of carbolic acid to fluids in which putrefacation and fermentation would ordinarily take place, prevented the occurrence of these processes. He considered pus formation was the result of the action of germs falling from the surrounding air into a wound.

By applying germicidal reagents to wounds and suppurating surfaces, he attempted to destroy these organisms outside the body whilst they were attacking the weak points. This was really the first step in the direction of an antiseptic treatment of wounds. Whilst treating by his method wounds in the human subject and dog he saw that pus remained entirely absent or was reduced to a minimum, putrid alterations were absent, and the wound healed rapidly. The chief importance of this theory was afterwards fully worked out by Lister, who saw that owing to the difficulty of killing germs, after they had once made their way into the tissues, it was absolutely necessary that such organisms should be prevented from gaining access to the wounds at all, and it is upon the attainment of this end that his well known antiseptic treatment depends for its success. Accepting the truth of this statement that germs were the cause of fermentation, Lister also came to the conclusion, independently, that germs entering the wounds from the outside might be the cause of suppuration, and since germs were floating in the air, were suspended in water, and were attached to the instruments and bandages that were used in the treatment of wounds, he determined that it was necessary, by using some germicidal agent, to kill such adherent and suspended organisms before the various materials mentioned were allowed to come in contact with the wounded tissue. With a rare combination of experimental resource, patience, and genius Lister gradually built up a theory and practice of antiseptic surgery which rapidly revolutionized the treatment of wounds.

Necessary details to be strictly observed in the treatment of wounds so as to secure immediate union.

COMPLETE ASEPSIS.

The strictest antiseptic precautions are necessary to secure absolute asepsis. Antiseptic measures are employed for rendering the wound and everything that is brought in contact with it in a thoroughly aseptic state. The thorough removal of micro-organisms from the seat of operation is the surgeon's first duty, and this is accomplished by shaving and washing with soap and warm water, turpentine, ether, and alcohol, then disinfecting the parts with a germicidal solution, such as a 5 per cent. carbolic acid solution, or 1 in 1,000 solution of corrosive sublimate. Sir Joseph Lister has lately recommended a weak solution of double cyanide of mercury and zinc, in preference to carbolic acid, as it appears this germicide exerts an inhibitory effect upon microbes which still remain in the wound or its neighbourhood which prevents them from multiplying in the tissues or in the dressings. The hands of the operator and his assistants should be purified by washing and brushing them in warm water and soap, and then with corrosive sublimate solution 1 in 1,000, or carbolic acid solution 1 in 40, and, lastly, in alcohol. The parts beneath the finger nails require to be well brushed.

(2) On each side of the wound, or part to be operated on, a towel wrung out of an antiseptic solution should be spread evenly, so that while operating the instruments and sponges will not be in contact with septic clothing, or the surface of the body. Sterilised sponges or aseptic lint or gauze alone should be used. The patient should be laid on a dry linen sheet, and covered with a similar sheet, except over the parts to be operated on.

(3) The instruments should be steel, with metal handles, nickel plated, so that they can be readily boiled in clean water, or with 1 per cent. bicarbonate of soda added to the water.

ARREST OF HAEMORRHAGE.

(4) All bleeding should be carefully arrested, as blood clot (1) separates the edges of the wound, (2) becomes a medium in which micro-organisms can grow readily, (3) gives rise to tension and pain. Therefore the careful arrest of haemorrhage is of the first importance in the rapid healing of a wound.

ACCURATE SUTURING.

(5) The best results in surgery follow the one who is painstaking in following out the minutest details. In the treatment of wounds the surgeon's duty is not only to unite the surfaces of wounds accurately and neatly, but to unite when necessary tissues of the same anatomical and physiological function. Divided nerves, tendons, muscles, fascia must be separately united with buried sutures before the wound is closed by the usual interrupted suture. When several nerves or tendons are divided in the same wounds, as in extensive wounds of the forearm, great care must be taken to join the ends of the same nerve or tendon. Buried sutures are absolutely necessary where accurate apposition of a deep wound is required, catgut or silk is best for sutures. The bandage to retain an absorbent antiseptic dressing should be applied firmly and evenly so as to make uniform compression, and afford support to the injured vessels and tissues.

PHYSIOLOGICAL REST.

(6) In the after treatment of a wound it is of the utmost importance to keep the parts completely at rest. The injured part must be kept in such a position as will permit of a proper blood supply, and prevent passive congestion. A wound properly dressed should not be disturbed until it has united. If pain, rise of temperature, or saturation of the dressings with discharge has not arisen the first dressing should remain undisturbed from one to three weeks. In wounds of the intestines rest is secured by abstinence from food. In wounds of the bladder distension of the organ is prevented by the introduction and retention of a catheter. In wounds of the brain rest is secured by keeping the room dark and quiet.

Amongst the advances made in surgery during recent years the suturing of wounded nerves holds a foremost place.

PRIMARY NERVE SUTURE.

was first performed by Baudens in 1836, but not successfully, by Nélaton in 1863, and by Langier in 1864. At first the silk sutures were left long, and afterwards came away by suppuration. This was a tedious and unsatisfactory method. O. Weber recommends the passing of the sutures through areolar tissue surrounding the nerve – the paraneurotic suture. In small nerves this method may be sufficient, but in large nerves sutures can be passed quite safely through the substance of the nerve as well as through its sheath. I have had three cases where after extensive wounds in the forearm, followed by paralysis of the parts beyond the injury, the median nerve having been completely cut across, was carefully sutured, and in about six weeks afterwards the functions of the nerve were restored, and the three patients (a baker, mechanic, and a housekeeper) can perform all their duties quite well. Fine chromicised catgut, carbolised, was used by me in each of the cases, but fine silk, sterilized, is equally

good.

SECONDARY NERVE SUTURE.

was first performed by Nélaton in 1865. After extensive wounds, when the cut nerves do not unite, the ends become bulbous and the distal end of the nerve undergoes degeneration, and the muscles supplied by it become wasted and useless. Both ends must be freed from all cicatricial adhesions before approximation is attempted; and if this cannot be easily accomplished because of the retraction both ends must be carefully stretched, so that there may be sufficient elongation obtained to permit the ends to remain after suturing without tension on the suture. The limb should be kept flexed. In case the ends are separated 2 inches or more the ends should be vivified and a nerve of a similar size from a rabbit transplanted between them.

As a result of the careful aseptic treatment of wounds important operations can now be undertaken and successfully performed in regions which were looked upon by the older surgeons as entirely outside the range of surgical operations.

SURGERY OF THE BRAIN AND SPINAL CORD.

Injuries to and diseases of the brain and membranes have at all times been of the greatest importance to surgeons, but until recently, treatment was chiefly directed to the injuries of the superficial parts. Post mortem examination often showed that many cerebral lesions could have readily been reached and treated by operation had the surgeon known how to locate them. Until 1870 there were two chief obstacles to the advance of cerebral surgery. *First*., Inflammatory action so often followed intra-cranial operations, and frequently ended fatally. *Second*, The brain was a region little known, and few signs were understood which would show the diseased area. From 1870 Lister showed by the antiseptic treatment of wounds that immediate healing was the rule without suppuration, and head wounds were no exception. Broca, in 1861, by careful observations was able to locate a limited area as the seat of the faculty of speech. Many observers were working diligently in the same field, and in 1870 Fritsch and Hitzig published an account of their observations. They clearly demonstrated the presence of a series of circumscribed areas on the surface of certain of the cerebral convolutions: the electrical stimulation of which caused on the opposite side of the body co-ordinated movements in distinct groups of muscles. Ferrier and Horsley have greatly extended the study of this subject by their careful clinical and pathological observations on patients, and by experiments on monkeys and other animals. So that now there is established beyond any doubt the existence of certain parts in the human cortex cerebri intimately connected with the motor and sensory functions of certain parts of the body. The first obstacle in the treatment of cerebral wounds – viz., suppuration – has been removed since the introduction and adoption by surgeons generally of Lister's antiseptic treatment of wounds. The second obstacle has been removed by the labours of Fritsch, Hitzig, Ferrier, Horsley, and many others, who have demonstrated the presence of distinct motor and sensory areas in the cortex of the cerebrum.

In the parietal region grouped round the fissure of Rolando are the areas associated with movements of the opposite side of the body, and at the lower end of the fissure those related to movements of the mouth and tongue. In the study of craniocerebral topography the surgeon has to rely on four primary landmarks in establishing a system of measurements.

1st. The glabella or root of the nose which bears a definite relation to the anterior limit of the cranial cavity.

2nd. The occipital protruberance which bears a similar relation to its posterior end, corresponding to the junction of the falx with the tentorium.

The whole mass of the cerebrum is disposed between these two points, and they bear definite relations to its cortical matter uninfluenced by the structure and contour of the bones forming the vault.

The 3rd landmark is the external angular process of the frontal bone which bears a relation to the lateral expansion of the frontal lobes similar to that borne by the glabella and occipital protruberance to the anterior and posterior extremities of the cerebrum. It has also a uniform relation to the fissure of Sylvius.

4th and lastly. The parietal eminence marks the greatest lateral expansion of the substance of the hemisphere, and bears a special relation to the submarginal convolution.

The operative treatment of cerebral lesions requires an accurate diagnosis by means of cerebral localisation, and a careful study of the clinical and etiological aspects of the case. If an abscess develops in the brain after a fracture has healed, or a tumour grow in the motor region round the fissure of Rolando, the skull must be opened at a point over the abscess or tumour. By means of accurate measurements, which are given in all text books on brain surgery, the motor centre or centres affected by the lesion are marked on the shaved and disinfected scalp before the skull is exposed, and the exact position of the lesion is also marked on the skull by

making a puncture through the scalp with a small perforator, so that the position can be recognised after the soft parts have been reflected. The bone is exposed at this point by a horse shoe shaped incision, the convexity of which is directed upwards. The flap, with the periosteum attached, is turned downwards. After all haemorrhage has been arrested the skull is opened, either by using a trephine or a chisel. The circle or chip of bone removed is placed in a warm antiseptic solution to be reimplanted if required. If the dura mater is tense and bulge into the opening, and cerebral pulsations are feeble or wanting, the skull has been opened near or just over the tumour or abscess. The brain can now be carefully explored in different directions with a fine hollow aseptic needle with safety. An ordinary exploring syringe, with a fine needle about 4 inches long, is best suited for the purpose. When an abscess has been found the needle is used as a guide for a small pair of torsion forceps, which is pushed along its side until the abscess has been reached, the blades slightly opened and withdrawn, and a fine drainage tube passed along the track to the abscess cavity. After the abscess has been opened and drained it should be carefully syringed with a 2 per cent. Boracic Acid solution. If bone-chips are re-inserted in the trephine wound the drainage tube should be inserted in the most dependent part of the wound. The flap is now secured by sutures of sterilised silk, catgut, or horsehair. The drainage tube should not be removed until the abscess cavity is closed.

In patients suffering from severe forms of epilepsy, where the usual methods of medicinal treatment have been tried in vain, trephining the skull has been found useful in a certain number of cases, especially in those cases in which the signs pointed to the pressure of a tumour, or abscess, or depressed bone over the motor areas. This method of treatment is a decided step in advance. During the past two and a half years I have successfully trephined the skulls of four patients, each suffering from a compound depressed fracture of the skull. In one patient, a man aged 45 years, who suffered from dementia, caused by the pressure of a depressed fracture of the skull, two weeks after trephining the skull and elevating the depressed bone, and re-implanting the bone which was removed by the trephine, he became quite sane, and has remained well ever since. He is now attending his usual work. In another patient, a boy aged 14 years, in which the depressed fracture was just above the left parietal eminence, and was caused by the stab of a knife. He suffered from Aphasia and Hemiplegia of right arm, leg, side of face, and tongue. After trephining the skull and elevating the depressed fracture hernia cerebri formed, and about four ounces of brain substance escaped. He made a good recovery, and in months after the operation he could walk about. He has kept well since, merely showing evidence of less intelligence than before the injury. The remaining two cases made good recoveries. In all the cases the wounds had firmly healed, and the patients were able to return to their duties in about four months after trephining.

SURGICAL TREATMENT OF LESIONS OF THE SPINAL CORD.

The operation of trephining the spine for the relief of or motor or sensory paralysis caused by pressure on the cord, has been practised since Heister, in 1757, first recommended it, although at that time and for a long time after the operation was condemned by most surgeons. Heister (General System of Surgery, 6th edition, 1757, p. 140) says, "But to offer the patient no assistance because we despair would seem cruel and uncharitable; therefore we must try our skill though our attempts should be in vain, in order to which the surgeon must lay bare the fractured vertebrae with a scapel, and replace or else remove such fragments as injured the spinal marrow. Mr. Herbert Page, in Heath's *Dictionary of Surgery*, page 134,1881, referring to the treatment of fractures of the spine, says "The operation of trephining the spine proposed many years ago and adopted several times has made no progress in surgery, nor is it likely to do so. It is an operation not within the range of practical surgery."Mr. Erichsen, in the last edition of his *Surgery*, says "The operation is not necessarily dangerous, it does not appear often to have hastened death, and has certainly in some cases afforded relief." The operation has been generally objected to because of

1. Haemorrhage.
2. Difficulty in clearing the neural canal.
3. Physical difficulties of treating the fractured vertebrae.
4. The hopeless nature of the damage of the spinal cord.
5. Septic infection.

By carefully making an incision along the spinous processes over the seat of injury or lesion, and separating the soft parts from them and the laminae by a scapel and retracters, the haemorrhage can be easily arrested by torsion forceps and sponges, and the spine and lamina removed by strong cutting bone forceps, chisel, and fine saw. The spinal cord can be examined, and if pressed upon by bone, blood clot, an abscess, or a tumour, treatment may be successfully adopted, and the pressure removed from the cord.

Should the cord be completely cut across then we may possibly do some good, and certainly if proper precautions are taken to keep the wound strictly aseptic we can do no harm.

On the 9th June, 1887, Mr. Victor Horsley, of London, successfully removed a tumour from the spinal cord of a captain, aged 45 years. The tumour, which was about the size and shape of an almond, was attached by its lower end to the highest root of the left fourth dorsal nerve, and rested upon the left lateral column and posterior root zone of the spinal cord. The patient had been suffering from the effects of the pressure of the tumour on the cord for over three years. At first the patient complained of paroxysms of great pain in the lower limbs and abdomen, and for four months previous to the operation he had complete motor paralysis of both legs, and loss of sensation as high as the ensiform cartilage. The patient made a good recovery after the operation, and on the 24th January, 1888, he was shown to the members of the Medico-Chirurgical Society of London. He could then walk three miles with ease. This was one of the first recorded cases in which a tumour involving the spinal cord was exposed, and successfully removed by operation.

(See full report of this case published in Vol. LXXI., *Medico-Chirurgical Transactions*, London, 1888.)

Dr. W. MacEwen, of Glasgow, in 1888, published (*British Medical Journal*, 1888, vol. II., p. 309) the results of six cases in which trephining of the posterior laminae of the vertebrae had been performed by him. Four had completely recovered, and two had died, one from extension of tubercular disease months after the operation and after the wound had healed, leaving one in which the operation possibly hastened the death of the patient, who was otherwise in a painfully helpless and hopeless condition.

There is no special liability to septic infection in wounds of the region of the vertebrae, and by careful aseptic treatment and drainage it can be prevented. Recently (September 19th, 1891) a patient, John D_ , aged 40, labourer, was admitted to the Belfast Royal Hospital suffering from complete loss of power of motion, and sensation of both legs and the lower part of the body from about an inch below the level of the crest of the ilia, with loss of control of the sphincters of the rectum and bladder. The paralysis was produced by a fracture-dislocation of the last dorsal vertebra caused by a bank of earth falling on him while he was in a stooping position. The paralysis followed immediately after the accident, which had occurred 11 weeks previous to his admission to the hospital. A bedsore had formed about the size of a crown piece over the lower end of the sacrum) otherwise he was in good health. As the patient was in a helpless state without much hope of recovery, except by operation, and after consultation with Drs. Cuming, Wheeler, and Logan, and having received the consent of the patient and his friends, I, assisted by these gentlemen, on 23rd September last removed the spines and laminae of the 11th and 12th dorsal and 1st lumbar vertebrae, and exposed the spinal cord, which we found completely cut across opposite the body of the 12th dorsal vertebra, and united again by areolar tissue. The wound healed in eight days. The patient states he feels less pain in his back, and less discomfort than before the operation. The paralysis of the limbs remain as before. The superficial reflexes remain normal. Still the operation was justifiable, even though the spinal cord was found completely severed, and the patient has the satisfaction of knowing the exact condition of the injured parts and the hope he has for the future. He left hospital, October 14th, much relieved by the operation.

The conclusions to be arrived at in considering the facts demonstrated by the foregoing cases are quite clear, namely, when a correct diagnosis is made the proper treatment to adopt is to remove by early operation the cause of the pressure on the spinal cord – whether bone, tumour, or abscess.

Abdominal Surgery.

Until the advent of the aseptic treatment of wounds the treatment of abdominal diseases was generally regarded as the special privilege of the physician. But by the labours of Spencer Wells, Keith, MacCormac, Tait, Bantock, Thornton, Mayo Robson, Greig Smith, Senn, and many others, such diseases as intestinal obstruction, suppurative peritonitis, cancer of the stomach and intestines, obstructed gall duct, renal abscess or calculus, ovarian and uterine tumours can now be successfully treated by the surgeon. By adopting strictly aseptic methods the surgeon can now open the abdomen, confirm or disprove the previous diagnosis, and in suitable cases operate for the relief of such diseases as above mentioned with an amount of success entirely unknown thirty years ago.

Radical Cure of Hernia.

In the radical cure of hernia great advances have been made during the past five years. Previous to that time this operation, performed according to the older methods, was uncertain and dangerous, but now can be performed by the aseptic method with much greater safety and success, both in children and

adults. In four patients under my care in hospital, whose ages ranged from 2¾ years to 7 years, and who suffered from congenital inguinal hernia, and where a truss was found insufficient to keep the hernia reduced, the operation in each case was performed successfully. On 23rd September, 1891, I operated for the radical cure of a right inguinal hernia on a boy, aged 18 years. The patient had tried to enlist in the army, but was rejected on account of the hernia. In seven days after the operation the wound was firmly healed. In three weeks he left hospital with no sign of a return of the hernia. On the 3rd September, 1891, I operated on a widow lady, aged 56 years, who had suffered from a large irreducible femoral hernia for 20 years. I removed over 1 lb. of omentum, twisted and ligatured the sac. The wound had healed in 11 days. I merely mention these cases to show how simple and safe is the radical cure of hernia when conducted by strictly aseptic methods.

In the preparation of this address I acknowledge with pleasure the valuable information I have received from Dr. Sims Woodhead's recent work on *Bacteria and their Products*, 1891; and Senn's *Principles of Surgery*, 1890.

In this brief summary of a few of the advances made in the science and art of surgery during the past ten years, I wish to emphasize one lesson particularly, namely, that the proper treatment of a wound is of the greatest importance in the success of any operation, and this can only be accomplished when the surgeon (1) secures for the wound and everything that is brought into contact with it a thoroughly aseptic condition, (2) carefully arrests all haemorrhage, (3) accurately unites the edges of the wound with sterilised unirritating sutures, (4) and places the wounded parts in the position of physiological rest.