Local Board of Health, viz., the magistrates. The health of cattle is considered by the legislature as belonging to a different category to that of people. The care of milk-shops, cow-sheds, and stables, are placed in the hands of another authority, who have to be at the same time both prosecutors and judges; a condition of things which ought not to be. This state of the law has had an origin in a desire to protect the farmer at the expense of the ratepayer, and to do that for cows which would not be tolerated if the preamble was applied to human beings or to dead matter. The Contagious Diseases (Animals) Act is perfectly ineffective for the purpose for which it was nominally passed, whilst it must have had an effect in decreasing the stock in the country. I will give you one instance out of several which has come to my own knowledge. Pleuropneumonia appeared in a farmyard among forty cows, which were in one shed. The local inspector isolated the first cow, leaving thirty-nine in the shed in which the case first appeared. Three others fell, one after the other, with the disease, and were taken out, slaughtered, and buried on the premises, but the rest of the herd were left in the shed. The sewage of the shed drained into a covered cesspool, which had no outlet for the gases of decomposition except into the shed itself.

The case came to my knowledge from my having to declare the place infected with pleuropneumonia, and having to make an order preventing the removal of cattle from the farm. I had the curiosity to examine the place, after an inspector from the Local Government Board, as well as our own veterinary adviser, had agreed that proper steps had been taken to prevent the spread of the disease.

Let me put a similar case among human beings. Could anything be more suicidal than to keep thirty-nine unvaccinated people in a building in which a case of small-pox had appeared, taking the case away, but leaving the fomites. Twenty-two of the cows failed with pleuropneumonia, one after the other, in about six weeks, were taken out, slaughtered, and buried on the premises. Ultimately, the owner had the remainder killed to use them as food. If the sanitary arrangements in this case had been in the hands of an able medical officer of health, is there any doubt but that the larger portion of that herd would have been saved, instead of consigning them to ignominious burial. In fifty-four days from the removal of the last case, although twenty-two cases are buried on the premises, they will have the right to be declared free from disease, and they may be again occupied as cow-houses, although the germs of disease must be still there.

It stands to reason that all matters connected with the health of either men or animals should be under one chief, who should be responsible only to one authority in one district. That district should have natural boundaries, and the medical officer of health should be in immediate accord with the veterinary inspector, the medical officer of the board of guardians, and the whole of the inspectors of nuisances, within the district. The latter, indeed, should be his officers. All reports connected with the health of the district should be transmitted to him, and by him transmitted in a condensed form either to a county authority, or to the minister of health. A county board, consisting of a combined area having a board for the consideration of principles, would be the best. This board should have its county medical inspector, who would be like the colonel of a regiment. It should be an office to which efficient medical officers of health might be promoted, and these commanding officers ought to be in direct communication with the minister of health. Until some such scheme as this be enacted, sanitary laws will not do all the good which is to be expected from them; and such a change cannot be brought about until the people, as well as the profession, are in accord as to the dogma of prevention being better than cure.

BRIDGWATER URBAN AND RURAL.—Mr. F. J. C. Parsons, the medical officer of health for both of these districts, has a somewhat uneventful state of affairs to record for the year 1879. In both districts, phthisis and diseases of the lungs were very prevalent and fatal. The infantile mortality in each was exceedingly small, being respectively 75.1 and 30 per 1,000 births. The drainage of both town and country districts is unsatisfactory, and should receive early attention. The town has the benefit of a public supply of water; but in part of the rural district the question of the provision of a pure and adequate supply is stated to present great difficulties. The removal of nuisances in both areas seems to be carried out with satisfactory diligence, and with little friction. The authorities have provided a hospital for the isolation of infectious patients, which was used with good effect last year. The death-rate for the urban district was 16.3, or considerably less than in the previous year; that for the rural district remained at the same figure as in 1878, viz., 15.1 per 1,000.

ON A CASE IN WHICH ONE-THIRD OF THE CLAVICLE, THE WHOLE OF THE SCAPULA, AND THE UPPER EXTREMITY, WERE REMOVED FOR SARCOMATOUS GROWTH AROUND THE SHOULDER-JOINT.*

By EDWARD LUND, F.R.C.S.,

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THE removal of the whole of the shoulder, not for injury, but for sarcomatous growth around the joint, is so rare and formidable an operation, that I trust a short description of such a case, with a few practical details connected with the operation, may be deemed not unworthy of being placed on record at this meeting of the Surgical Section of the British Medical Association.

The case is briefly this. John Heys, aged 20, a weaver, was admitted into the Manchester Royal Infirmary, under my care, on September 15th, 1879, for a large tumour upon the left shoulder. He was a fine, strong, healthy-looking man, but, unfortunately, when a child had experienced some severe accident affecting the right side of the body, and this had left ankylosis of the right elbow-joint nearly in a straight line with the arm, and atrophy of the muscles in those parts from disuse. From the same cause there was also a slight stiffness of the right knee-joint. It was stated that his family history was good, and that no cancerous affection, or any special form of strumous disease had been known among his relatives. Heys informed me that thirteen weeks before admission to the infirmary, he had sprained his left shoulder in trying to lift some heavy weight, and in doing so it suddenly swelled, so as to prevent him from working any longer on that occasion. It was not apparent that any special treatment had been adopted, and five weeks previous to admission the swelling began to increase very rapidly, and considerable pain was experienced around the shoulder—not along the line of any particular nerve, but a generally diffused pain, which existed at all times, not more by night than by day. On his admission to the infirmary the measurement of the left shoulder was as follows. Just below the folds of the axilla the circumference was about sixteen inches, and round the arm two inches lower down it was about thirteen inches. The swelling extended far back, almost beyond the margin of the deltoid muscle, so as to overlap at least one-half of the breadth of the scapula. The movements of the shoulder, when passively performed, were fairly good; but the man had little power to raise the arm himself, and it was noticed that in such movements there seemed to be an undue mobility, and, as far as we could judge, the centre of motion was below the head of the humerus, and not in the situation of the glenoid cavity. The swelling seemed to fill the cavity of the axilla, but no enlargement of gland could be there detected. The pain did not appear to be very intense, although the patient was never entirely free from suffering. The tumour had a firm, elastic feel; the skin over it was somewhat stretched, but no fluctuation could be detected at any part. In trying to conjecture the exact nature of the case, it appeared to me that there were four possible conditions. It might be that at the time of the sprain some small vessel, most probably a vein, had given way near to the joint, and that we had now to deal with a blood-tumour, in which the blood was tightly compressed by the superjacent tissues, the fluctuation being in this way concealed. Or it might be, as a consequence of this, or from the original injury, that we had to deal with a deeply-seated abscess. Again, being reminded of an obscure case affecting the same part, which from rapidity of growth was thought to be malignant, but ultimately proved to be a lipoma—it occurred to me that in this present case there might have been a fatty tumour or fatty growth beneath the deltoid, which enlarged and grew more quickly after freeing itself from pressure by lifting the border of that muscle. Lastly, as perhaps after all the most reasonable interpretation, I thought the case I had now to deal with might be a sarcomatous tumour of the humerus, infiltrating the surrounding tissues. There was no excess of temperature to indicate the presence of suppuration, and there was no general cachexia to suggest any malignant taint. It was determined, accordingly, on September 26th, after the man had been in the hospital eleven days, lying in bed on account of the weight of the shoulder, that an exploratory incision should be made. Under chloroform and antiseptic precautions, a pretty deep and long incision was made through the deltoid muscle down towards the centre of the joint. No pus or fluid blood escaped, and a small slice of the tumour

* Read before the Surgical Section at the Annual Meeting of the British Medical Association in Cambridge, August 1880.

was removed. After this the finger was introduced, and then it was found that the upper portion of the humerus was expanded and softened, breaking down readily on the slightest pressure, and on microscopic examination of the piece removed, it was found to be a sarcomatous growth, with spindle-shaped cells. We could now understand how the centre of motion of the joint was removed from its natural position; for while attempting to lift the arm we had been bending the softened bone. No further step could be taken on this occasion, as the patient had not consented to any serious operation. In spite of all our care, a slight erythematous flush appeared around the wound the following day; some constitutional disturbance resulted; the temperature rose to 103.4, and continued very high for forty-eight hours. Quinine was given in large doses, and the shoulder was covered with lint moistened with lead and opium lotion, the antiseptic dressings being discarded, as it was probable that in the explorations made, our antiseptic precautions had been violated. On September 30th all redness had entirely subsided, the temperature had fallen to 101.4, and in two days after this it had become normal.

Reviewing all the possible prospects of the case, I determined that if any operation were to be undertaken it should be sufficiently extensive to go beyond the limits of the disease. Having obtained the patient's consent, I proceeded on October 3rd to perform the following. The patient being laid on his back, somewhat inclining to the right side, so as to raise the left shoulder, and everything being carefully arranged for the antiseptic treatment of the case, the first incision I made was parallel to the clavicle, commencing about the junction of its internal and middle third, upon its anterior border. This was continued horizontally outwards to the acromion. A few touches with the scalpel enabled me to raise the tissues and expose the bone. I then took one of the raspatories used for separating the soft covering of the bony palate in operations on the mouth, and with this I more completely detached the parts around the clavicle, keeping very close to the bone, until I had made a passage beneath it, or between the bone and the subclavius muscle. In this passage I inserted a long thin ivory spatula, upon which I sawed through the bone, feeling confident that the vessels beneath were protected. I then carried an incision from about the middle of the one already made, backwards over the top of the shoulder, dividing sufficient structures to bring into view the edge of the trapezius muscle, and about two inches of its surface. In a similar way, nearly opposite to this incision, I made another in front, in a curved direction downwards towards the axilla; then, raising the loose piece of clavicle, and carefully dividing the fibres of the subclavius beneath it, also the attachment of the lesser pectoral muscle to the coracoid process, and fibres of the larger pectoral muscle, I found that through the weight of the shoulder and arm, which had a tendency to fall outwards, there was no difficulty in obtaining a free space between the two pieces of clavicle. Here, by careful cleaning, I soon felt the pulsation of the subclavian artery. But the vein was concealed from view, as it lay closely upon the rib, still under cover of so much of the subclavius muscle as was still attached by its tendinous portion.

In making some of these early incisions, to prepare the way for exposing the subclavian artery and securing it, I divided the suprascapular artery. I immediately seized the proximal end and tied it, but rather sharp hemorrhage continuing, it became necessary to ligature also the distal end. This was a fortunate occurrence for me, since it at once suggested that in performing this operation it would be better not to divide any artery without first passing round it two ligatures, and then cutting between them. The arterial anastomosis around the shoulder-joint is so abundant that unless this precaution be taken rapid hemorrhage is very likely to occur; whereas by pursuing the plan indicated in an operation so serious as this one for the removal of the entire shoulder, the amount of bleeding was extremely small. I cannot venture to estimate exactly what the loss was in the present instance, but I am within the bounds of correctness in saying it did not exceed three ounces, taking venous as well as arterial blood.

Acting on this idea, and guided by the finger, I sought carefully for the pulsation of the subclavian itself, and having exposed it as it emerged from the margin of the scalenus muscle, and placed two ligatures upon it, I cut between them without any bleeding following. The vein was afterwards treated in the same way. It was interesting to notice, as the shoulder fell outwards from the mesian line of the body, how very prominent the seventh cervical nerve became, and how closely it was seen to follow the somewhat vertical direction of the third part of the artery. This and all the other nerves I divided with the scissors, taking care to use very sharp ones, as I thought that by so doing the nerve fibres would be less dragged and injured.

The next step was to divide the trapezius muscle close along the line of its attachment to the spine of the scapula. The transverse cervical and posterior scapular arteries were secured, and tied with the com-

panion veins, as were several other smaller arteries and veins, as they came into view. The cellular tissue within the axillary space was not occupied by the disease, for this seemed to have commenced in the humerus, and spread chiefly along the direction of the deltoid muscle. One or two glands being slightly enlarged, were removed; otherwise no fresh distinct growth could be said to exist in the axillary space. Dividing the latissimus dorsi muscle, and guided by the vertebral border of the scapula when drawn away from the chest, I had no difficulty in separating from it the thin margin of the serratus magnus muscle, with the rhomboids and the levator anguli. The last incision to be made was a vertical one, following the line of the internal third of the scapula, and sweeping forward into the axilla.

In this way I think I have described all the incisions which were required, so as to detach the entire limb from the body. On account of the time occupied in tying each artery separately, the operation was a very tedious one; but when the last incision had been made, little remained to be done besides bringing the edges of the wound together. And here I was struck with the wonderful way in which the skin at the back, beyond the extent of the original growth, could be slipped forwards so as to meet the anterior border of the wound, and cover the side of the chest. This was rendered possible from the fact that the upper part of the chest being conical, when the scapula and the clavicle have been removed, much less skin is required to cover the surface.

The very large wound thus formed was closed with twenty-four sutures. A long drain-tube was placed in front, and another, perforating the posterior flap just where it ceased to be attached to the back of the chest, afforded sufficient exit for any blood or serum which might accumulate in the cavity. The wound was covered with the usual antiseptic dressings, arranged with sufficient amplitude, and secured in position by an elastic India-rubber-webbing-bandage. The visible pulsation of the cut end of the subclavian artery, and of several other smaller branches, fully testified to the condition of the circulation, and the satisfactory way in which the vessels were controlled.

The after-progress of the case was very satisfactory, considering that so large a wound had been produced. From the length of time the operation occupied, and the quantity of chloroform required, there was considerable depression afterwards; but this was relieved by administering an enema consisting of five grains of quinine dissolved in half an ounce of compound tincture of camphor, mixed with one and a half ounce of thin starch. This was repeated two or three times at intervals of four or five hours. It is a form of treatment, I may observe, in surgical injury, with which I have much reason to feel satisfied, especially where shock from any cause is very excessive. Whether it is the absorption of the opium contained in the tincture, or the stimulating effect of the spirit, or the tonic action of the quinine, I know not; but the combination I have just mentioned has so frequently proved beneficial, that it is a great favourite with me under such conditions.

The temperature in the morning, before the operation, is reported to have been 99.2. In the evening, after the operation, it was 97.0. The next morning it had risen to 102.0. After this it never again rose above 100.4.

The reports are as follows. On October 5th (the second day after the operation), "Sleeps without any narcotic. Takes his food well, viz., jelly, beef-tea, milk, etc." On October 6th, "Patient doing well; pulse good (100 per minute). Wound dressed for the first time; no discharge; no redness or swelling along the line of sutures; a little coloured serum had escaped through the drainage-tube at the back; no pain; temperature 99.6". On the 7th (the fourth day after the operation), "Temperature 99.2 in the morning, 99.8 in the evening." On the 9th, "Eats and sleeps well, wound dressed to-day; eight of the sutures removed; drain-tube at the back removed". On October 11th, "Dressed again; eight more sutures removed; looks remarkably well; union going on favourably". On the 15th, "To-day all remaining sutures removed, and the drain-tube in front discontinued". On the 17th, "No discharge; wound almost healed; upper three inches firmly so; cicatrix supported by narrow pieces of plaster". November 1st, "Up for first time, and dressed to-day". November 8th, "Dressed for last time as a spray dressing; wound entirely healed; to stay a few days longer in the hospital, and then, using boric lint, to go home." This last date, it will be observed, makes thirty-sixth from the day of the operation.

I am happy to be able in this case to bring the patient himself before the Section. On examination, it will be very obvious to you how considerable a mutilation it was needful to subject him to, in order to check the advance of the sarcomatous growth. On making a dissection of the shoulder, the upper half of the humerus was found to have been disintegrated by the progress of the disease, so that any less extensive operation would not have been successful. I was compelled to carry my incisions very far back, as the disease had extended considerably in

that direction, and I believe that if I had not removed the scapula, I could not have covered the wound with healthy skin.

I have not sought with any great minuteness to ascertain whether any similar case has been recorded in surgical works, *i.e.*, where such an operation has been performed, not for injury, but for disease. We are aware that in military practice immense damage has been inflicted upon the parts around the shoulder-joint. Large portions of bone and soft structures have been removed, and occasionally recovery has followed, and a useful limb has been preserved. But here, sad as it is to sacrifice the upper extremity, more particularly when, as in the present instance (as you will see for yourselves when the patient comes in), the use of the right limb is imperfect, the exigencies of the case will, I trust, justify in your opinion the very serious treatment to which I felt bound to subject this poor man.

ON THE *POST MORTEM* EXAMINATION OF THE EAR, AND THE FREQUENCY OF DISEASE IN OR NEAR THE TYMPANUM.*

By DAVID FOULIS, M.D.,
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IN the course of *post mortem* research, one is struck by the difficulty which surrounds the investigation of the internal ear, and also by the indifference about it manifested by those engaged in general practice; and yet the diseases of the ear are not only very important in themselves, from the inconvenience caused by pain or by interference with the hearing, but, as is well enough known, ear-disease is a standing menace to the life of the patient, involving as it does the possibility of extension to the meninges or even to the brain. It is important, therefore, to have an easy and sure method of examining the ear in the dead body, in order to increase, if possible, our knowledge of the relation of ear-disease to other diseases of the body, to gain some idea of its relative frequency, and to gather hints for its treatment during life.

Turning now to the best authorities, I do not find any directions given such as are applicable to the ordinary cases of *post mortem* examinations. The latest authority, and perhaps the best on purely pathological anatomy, is Dr. Orth of Berlin. At page 86 of his work, he says: "It is but seldom that the *inner ear* presents conditions which are of interest to the general practitioner; but, if an examination be desired, it may be made as follows. The whole petrous bone should be separated from its attachments by two saw-cuts which come together in the sella turcica; and it may then be removed from its place, put in a vice, and sawn through from the posterior border of the external to the anterior or inner border of the internal auditory canal. The internal parts are thus laid open, and the drum-membrane left nearly intact.....An admirable view of the inner ear may also be obtained by removing the roof of the tympanic cavity, which is easily done [by either bone-scissors or mallet and chisel]." (*A Compend. of Pathological Anatomy*, by Joh. Orth; American translation; Boston, 1879.) For more minute directions, the reader is referred to Professor Lucae's article in Klebs's *Handbuch der patholog. Anatomie*, Band i, where a careful description is given of the removal of the petrous bone with chisel and saw, and of the mode of dissecting it bit by bit after removal. (See also Virchow's *Archiv*, Band xxix, s. 33.) Very excellent instructions are also given by Toynbee in the *Transactions of the London Pathological Society* (1853, vol. iv), which are, in the main, very similar to those of Lucae. Voltolini gives a method not widely different from the above in Virchow's *Archiv* (Band xviii, s. 38, 1862); and, lastly, von Tröltzsch details the *post mortem* examination of the ear in his *Lehrbuch der Ohrenheilkunde* (6th ed., 1877), from which I may quote one paragraph. (See also Virchow's *Archiv*, Band xiii.) After telling us to remove one or both temporal bones entire with the saw, etc., he says (page 588): "If it is desired to avoid all and every outward trace of resection of the skull, we might leave the squamous portion *in situ*, and with hammer and chisel separate the pyramidal part from it at the inner half of the external meatus just in front of the membrana tympani.....In the same way divide the connections of the pyramid (petrous bone), and with the assistance of the knife remove it. In doing this, however, fractures of the bone are readily produced in places where they are not wished for; and one must abandon a part of the external meatus, which may interfere with the completeness of our inspection, especially if suppuration or sinuses, with secondary abscesses, exist in or near the external auditory canal. This was the manner in which Wendt was accustomed to remove the petrous bone; but, taking

both together, whereby too, while avoiding any external disfigurement, he obtained a full view of the nose and throat." The whole of the petrous bone, tympanum intact, having been removed in one or the other way, full directions are given by von Tröltzsch for the further examination of the inner ear in successive portions.

It will be seen that all these authors have in view a very minute dissection of the inner ear; and the details, though varying slightly, have this basis. For aural work, accordingly, where the ear is the focus of attention, or where a previous clinical history has specially attracted notice to it, and where time can be afforded for carrying out these minute instructions, nothing more could be desired. But let any one engaged in pathological work try to put such methods into habitual practice, and he will inevitably find that he cannot apply them in any but a very few cases. The time occupied by them is considerable, regard being had to the many other points which must be noticed in a necropsy; and the restrictions placed by friends of the deceased deter one from very free excision of parts of the skull. I have, therefore, been led to use a simple plan for splitting open the tympanum *in situ*, which, during the last thirteen months, has stood the test of an extended trial so well that, I think, it may be recommended as useful for ordinary *post mortem* purposes; and, as I cannot discover a reference to it in any publication, it is perhaps worth while to record it.

Fig.—Modified from Quain's *Anatomy*, to show the site of the incision and the view obtained by it after the petrous bone has been split open. On the right side No. 12 is placed on the eminence, on the outer slope of which the incision A.B. is made; and on the left side the bone is shown laid open, and the membrana tympani, etc., exposed.

Referring to the woodcut (adapted from Quain's *Anatomy*), it will be seen that the incision A.B. runs, in an antero-posterior direction, along the outer margin of the eminence caused by the superior semicircular canal on the upper surface of the petrous bone. When the skull has been opened, the brain removed in the usual way, and the dura mater torn off the base, this eminence is, in the great majority of cases, quite distinct; and in those in which it is less well-marked, there is still sufficient indication of it to guide the chisel. The incision is made with the ordinary *post mortem* chisel, the cutting edge of which is applied as along the line A.B., parallel to the sawn edge of the skull, and perpendicularly to the anterior surface of the petrous bone. A smart blow or two with the mallet is sufficient to drive the chisel through the bone, and to detach the inner part of the petrous bone, which may then be levered or pulled further towards the middle line of the skull (as shown in the woodcut), so as completely to open up the tympanum. On the outer side, the membrana tympani is left intact with the malleus and incus; while on the loosened piece of petrous bone are to be seen the stapes and the parts forming the inner wall of the tympanic cavity. These parts having been examined, the loosened petrous fragment may be torn out, and, by a further splitting up with the chisel, the state of

* This paper was written in March 1880, when also the method was demonstrated to the Glasgow Pathological and Clinical Society.