

snoring, cooing, &c., all being merely modifications of the original rhonchus.

The sonorous rhonchus may be present either with inspiration or expiration, or simultaneously with both. If unmixed with the moist râles, it is a sound both dry and grave. It is of variable intensity, and not necessarily permanent. When very pronounced it often communicates to the hand the sensation of a vibratory thrill, and may be heard, without the stethoscope, at a distance from the chest. Sonorous rhonchus originates in a vibration of air in the bronchi, owing to some irregularity in their calibre, depending either on the presence of viscid mucus, or on some change of greater permanency in the tubes themselves.

The sibilant variety of sound differs from the sonorous, in possessing a sharper, more shrill, and often a musical tone. This sign, like the former, may accompany both acts of respiration; it is generally, however, more pronounced during expiration. The physical cause of the sibilant, is similar to that producing the sonorous rhonchus, and like it, its habitat in the chest, as well as its permanency, is extremely variable.

The rhonchus, termed pulmonary crackling, is a sound of less frequent occurrence than either of the preceding; nevertheless, when present, its pathological import is great. This sound imparts the impression of a succession of short dry cracklings, pertaining principally to inspiration, and most audible if that act be prolonged and deep. The lesion on which this rhonchus depends, is the deposition of unsoftened tubercles in the lung; hence its almost invariable locality, the summit of the chest. On the tubercles becoming soft, this sound gradually merges into that variety of crepitation, distinguished by authors as the moist crackling.

MOIST RHONCHI.

The consideration of the abnormal sounds characterised by humidity, embraces the different degrees of the crepitating, the mucous, and the cavernous rhonchi.

The crepitating râle, as its name implies, conveys the idea of crepitation. There are several modifications of this rhonchus, based upon the character of the crepitation and size of the bubbles, constituting the different degrees of the sounds described by authors, as the crepitating and subcrepitating. For practical purposes, I must confess that the very minute subdivisions of this rhonchus, appear to me to offer too great refinement, and tend rather to perplex than assist the auscultator. Careful and repeated investigation will enable the student to distinguish the leading modifications of the crepitating rhonchus, the diagnostic import of which will be fully considered hereafter, when studying their pathological signification. The sound of crepitation may be best imitated by the friction of a lock of hair, between the fingers close to the ear. It almost exclusively accompanies the act of inspiration, and is frequently uninfluenced by expectoration. The physical cause of this rhonchus has proved a subject of difference among writers on auscultation. Without analyzing the theories of each, its origin is probably two-fold, partly arising from the bubbling of air, circulating through liquids of variable tenacity, in the minute bronchi and pulmonary cells, and partly depending on the sudden expansion and separation of the tissue of the lung, from the viscid fluid by which it is infiltrated. The seat of the crepitating râle varies with the lesion on which it depends.

The mucous rhonchus frequently coincides with the sonorous, and may be distinguished from the crepitating by the sensation of greater liquidity, the bubbles of which (the mucus) are much larger, influenced however by the size of the bronchi. It accompanies both acts of respiration, and is usually much modified by cough and expectoration. The physical cause of the mucous rhonchus is the bubbling of air through mucus, blood, or pus, contained in large or moderate sized bronchi. Its usual locality is the middle or posterior portions of one or both lungs.

The impression afforded by the cavernous rhonchus is well expressed by its synonyms 'gargouillement' or 'gurgling.' In this, the bubbles are larger, less numerous, and of more irregular recurrence, than in the mucous variety. It is often more or less metallic in character, and when for a time removed by the emptying of the cavity by expectoration, its place is supplanted by cavernous respiration. This rhonchus commonly co-exists with both respiratory movements, and like the sonorous, is often audible at a distance, without the aid of the stethoscope; and may even occasionally be recognised by the patient himself. The physical cause of this sound is the passage of air through fluid contained in a cavity in the substance of the lung. The lesion on which it most frequently depends being tuberculous excavation, its favourite seat is, of course, the summit of one, or both lungs. When depending, as is more rarely the case, on other diseases besides tubercle, it may be heard indifferently in any part of the chest.

(To be continued.)

NEWCASTLE-ON-TYNE INFIRMARY.

Practice of SIR JOHN FIFE.

Reported by MR. FREDERIC ROBINSON.

CASE OF SEVERE INJURY OF THE SHOULDER, WITH FRACTURE OF THE HUMERUS, AND RUPTURE OF THE BRACHIAL ARTERY.

John Sawyer, aged 18, enginewright, a rather delicate looking lad, of nervous bilious temperament, was admitted on December 16th, 1844, under the care of Sir John Fife, at eight p.m., in consequence of having met with an accident, his right arm being entangled in a wheel connected with machinery, though in what direction the violence was applied, he cannot state; he had on a strong fustian jacket at the time. On his admission here, the injury was ascertained to be as follows:—The head of the humerus was fractured obliquely, downwards and inwards, and the whole of the articular surface, to the depth of a third of an inch in the centre, retained in situ, along with the lacerated capsular ligament. The long and short tendons of the biceps were uninjured, and the other fractured extremity of the bone, along with a third of its shaft, was forced through the integument of the axilla, beneath the belly of the biceps, and rested on the skin covering the pectoral muscles, in a position obliquely inwards and upwards, so that the arm being approximated closely to the ribs, and the forearm bent at right angles across the abdomen, the dislocated bones rested immediately beneath the humeral third of the clavicle. The wound was barely large enough to admit of the

passage of the bone, and the latter was so firmly constricted by its edges that its reduction could not be effected until the integument was divided to the extent of about half an inch, and then extension being used, at first backwards, and then obliquely downwards, the reduction was effected with slight difficulty, and the contour of the limb perfectly restored. The coraco-brachialis appeared to be much lacerated, but the rest of the muscles seemed to be uninjured. The reduction was effected in about fifteen minutes after his admission. The axillary artery, vein, and nerves, were nearly isolated; and the displaced bone rested on them; but they were apparently uninjured, and the vessel pulsated with the natural force, and likewise the radial artery at the wrist. There was very slight oozing of blood from the wound before and after the reduction of the bone, and he was enabled to walk to the infirmary directly after the accident, which occurred close by, and did not feel at all faint, and the pulse was full and vigorous when admitted. The pain was much mitigated by the reduction of the bone; shoulder slightly swollen; the edges of the wound were brought in close apposition by a single stitch; straps of adhesive plaster were applied, and cloths, steeped in an evaporating lotion, spread over the whole shoulder, and the arm laid in a semiflexed position on a pillow. Temperature of the limb rather diminished in the forearm. Ordered tincture of opium, half a drachm, immediately.

17th. Going on well; rested well during the night; pulse quiet and regular at both wrists, and of equal rhythm; arm easy, and swelling slightly increased; slight crepitation on pressing the integument surrounding the wound; bowels confined; no thirst; tongue clean; appetite bad; face rather pallid. Continue the lotion, with a drachm of tincture of opium to a pint. Repeat the sedative draught at night.

18th. Doing tolerably well; swelling not increased; passed a restless night, with some delirium about the middle, which soon left him; no headach nor thirst; bowels confined; pain of shoulder continues much abated; no swelling of forearm, or discolouration of its integument, or of that of the shoulder; no discharge from the wounds, the lips of which are in apposition, and look healthy; appetite bad; pulse quiet and regular in both arms; forearm feels rather numb; stitch removed. Continue the lotion; repeat the draught at night; a draught of compound infusion of senna immediately.

19th. Has passed a very restless night; took a draught composed of liquor potassæ, instead of morphia, by mistake—occasioned delirium; arm not so easy as yesterday; swelling still considerable, but no greater than yesterday; edges of the wound looking rather sloughy; no discolouration of surrounding integuments; a small quantity of fluid of a pinkish colour, resembling serum in consistence, flows from the wound when the arm is moved; great thirst; breathing natural; bowels open. Takes very little food, and that only in the fluid state; pulse firm and rather quick. Twelve leeches to the shoulder and afterwards a poultice.

20th. Symptoms rather more favourable; has passed a comfortable night; thirst abated; swelling of shoulder much diminished, and less pain felt; wound still looks rather sloughy at the edges, but no tendency to spread manifested; sickness abated; bowels open; appetite

bad; pulse quiet. An effervescent draught to be taken every four hours; repeat the sedative draught at night; continue the poultice

21st. Continues to go on pretty favourably; rested well; no delirium; still much thirst; some headache; pulse low and rather jerking, of equal volume at both wrists; countenance composed, but pale, and covered with perspiration; pain in the limb continues much abated; wound looks more healthy, but discharge thin and of a serous character; bowels open. Continue the effervescing draught frequently; omit the anodyne.

22nd, *mane*. Doing well; rested well without the anodyne; countenance more cheerful; thirst abated and tongue cleaner; appetite rather improved; no headache; the wound looks cleaner; shoulder continues much less swollen and painful; but rather more pain and swelling in the axilla and pectoral region, and the integument is here slightly inflamed, and on pressing the margin of the pectoral muscle about half an ounce of thin reddish-coloured serum escaped with a gurgling noise; rather more numbness of forearm; pulse quiet and regular, and equally rhythmical at both wrists. Continue the poultice.

4 p.m.—A small coagulum of arterial blood discharged from the wound, and a slight oozing of blood continues; arm pretty easy; no complaint.

9 p.m.—Complains of sudden accession of great pain, in the humeral and pectoral regions, with an increased feeling of numbness in the forearm; temperature of the limb little if any below the natural standard; no sickness or depression complained of; but countenance very pallid and anxious. There has been a rather more copious discharge of florid blood from the wound since the application of the poultice an hour ago, and a slow oozing continues from the upper part, but still only about five ounces has been lost since the afternoon; pectoral region appears fuller, and its surface smooth and rather loose, but not discoloured; does not feel more pain there than in the rest of the shoulder; pulse at the wrist of the injured limb *not perceptible*, neither at the brachial artery; pulse at the left wrist quick and full. Lint, steeped in cold water, to be applied to the wound and the rest of the shoulder; brandy and water occasionally.

12 p.m.—Oozing from the wound still continues slightly. Pulse quick and rather weaker. Feels the pain on the whole mitigated. Shoulder and arm rather more swollen. Pulse still absent from the right wrist.

23rd. Worse. Pectoral and humeral regions both much swollen, and the integument covering the former is very tense, smooth and glossy, and covered with a slight blush of erysipelatous inflammation. At the axillary margin of the pectoral muscle, the integument is more inflamed and elevated than elsewhere, and distinct sense of fluctuation apparent. There is also a small vesication lower down in the axilla. The wound itself looks pretty healthy, but the integument surrounding it is swollen much, and some coagulated blood is laying about it. The bleeding has been more active during the night, about eight ounces of blood having been lost, but it appears to have ceased now. No delirium during the night. Pulse quick and compressible, 130, none perceptible at the right wrist; respiration natural; thirst abated; has taken very

little food; bowels open; slight relaxation of sphincters; countenance pallid, and rather anxious. Application of wet lint to be continued.

3 p.m.—Much worse; evidently sinking; pectoral region greatly swollen, and integument so distended that it appears about to give way at the margin of the axilla; skin of a purplish hue; countenance very anxious and pallid; breathing hurried; pulse quick and scarcely perceptible; is very delirious and restless. The lips of the wound and integument surrounding them are much distended by a large coagulation of blood, which appears to have checked the escape of any more. He rapidly became comatose and died at ten minutes to five o'clock p. m.

Post mortem.—A hasty examination of the wound was all that could be obtained. A large quantity of coagulated blood, of a somewhat fetid odour, together with a good deal of serum, was evacuated on slightly pressing the margins of the axilla, and none at all was found extravasated in the cellular tissue below the wound. When the coagulum of blood which plugged up the wound was removed, the brachial artery was found to have been ruptured transversely across at its lower margin, and the inferior cut extremity appeared to have contracted a good deal, and was turned outwards. The upper extremity of the artery had retracted high up in the axilla, and was surrounded there by coagulated blood in large quantity. The brachial vein and nerves were uninjured. The fractured extremities of the bone appeared to be in the same state as at the time of the accident, no provisional callus being thrown out, and a small quantity of serous fluid contained in the joint. No attempt at union had taken place in the wound.

In this case, from the florid appearances of the blood, and the extravasation being much the greatest round the upper extremity of the divided tube, contrary to the more general rule, it appears that the effusion had taken place mainly, if not entirely, from the upper, and little, or none from the lower extremity of the vessel. It will be observed in the history of the case that no hæmorrhage occurred from the wound nor other symptoms, indicative of its existence, till the morning of the 22nd, and from that period till the morning of the day of his decease, there was only a gradual oozing from the wound, and the swelling had abated, till the evening of the 22nd, when the sudden accession of pain and tumescence seemed to indicate a more rapid progress in the effusion. The pulse also continued of equal volume to that in the sound limb, till the bleeding commenced, and then ceased entirely, a circumstance proving that the artery had continued pervious till then, though probably its coats were much injured; and a sudden movement, as he was very restless, and frequently altered the position of the arm, may have caused their rupture. No lymph nor blood was contained in the extremities of the artery, neither were there any marks of ulceration or disease of its tunics.

The subject of this case was a delicate lad, of highly nervous temperament, and the cause of death appeared to be, not so much the effect of the hæmorrhage, as the shock to the system, and by the time that the true nature of the cause and extent of the hæmorrhage became apparent, it was evidently too late to hope for any chance of recovery by securing the divided ends of the artery. Had not the unforeseen circumstance

of rupture of the vessel occurred, there was a good prospect of a favourable termination; and the case at the time of admission appeared to fully justify the attempt to save the limb. The injury resembled a compound dislocation very much, and the force appeared to have been applied in a similar direction to that in simple dislocation of the bone beneath the pectoral muscles.

PROVINCIAL
Medical & Surgical Journal.
WEDNESDAY, JANUARY 8, 1845.

The receipt of an important communication from the committee, appointed at Northampton, to consider the subject of the establishment of schools for the preliminary education of the sons of medical men, and the desire to give it the earliest possible insertion, obliged us to postpone some observations which we had intended for the first number of the current volume.

None can feel more fully alive than ourselves to the necessity of using every effort to make the voice of the profession heard at the present crisis, and for weeks past we have endeavoured to afford every facility to the expression of the opinions, of provincial practitioners especially, upon those subjects connected with the future establishment and constitution of the whole medical profession, in which both their individual interests and general position in society are so intimately concerned. Upon the present occasion, however, we must not forget, while desirous that the honour and respectability of the medical profession, and of every class or denomination which it embraces, should be maintained and secured, that other objects of equal importance are contemplated by the numerous and intelligent body of which this journal is the special organ. The questions of moment, at this time engrossing the attention of so many respected and influential members of the medical profession, have, it may be said, a bearing upon their individual and collective interests, as well as upon the well-being of the general community. The interested motive, in the great majority of cases, can have had but little effect, compared with the desire of benefitting society at large, in bringing out the veterans of the profession from the more congenial pursuits of an honourable occupation; and we feel assured that the discussions which have arisen on the provisions of the Medical Bill have, for the most part, arisen from a