with the soft palate, when the fissure extends quite through the head, as it is endowed with considerable muscular power, the obturator will be quickly displaced, unless it has a firm posterior attachment. Hence, for the treatment to be successful, some other mode of attachment had to be designed. The following was the plan adopted. An impression of the whole of the superior maxilla was taken in the usual way, and then another impression of one side only, which included not only the teeth and lingual surface of the maxilla, but the margin of the fissure and the nasal surface of the antrum of Highmore. (Fig. 2.) Upon the model obtained from this impression a gold plate was struck, extending from the necks of the teeth around the margin of the fissure, and over the nasal surface of the antrum. This plate was then put upon the model obtained from the first impression, and another plate was struck upon this model, extending from a little below the margin of the fissure of the first plate across the fissure to the necks of the teeth of the opposite side. The two plates were then soldered together; and, upon trying them, or rather it (as it was now, by soldering, one plate) in the mouth, it was found only necessary to carry it in edgewise, and that portion of the obturator which was intended to rest upon the nasal surface of the antrum of Highmore passed through the fissure; it only remained to raise the other edge to its place in the mouth, and the obturator was firm, without the aid of any clasps; but, as the patient lived in the country, it was deemed desirable, for further security, to carry a small clasp round the left cuspidatus. This made the obturator so firm when in its place that it could not be moved by a very considerable pull of the finger; and yet there was no feeling of straining upon the parts upon which the obturator rested. The lost teeth and alveoli were restored, and the case was finished. The obturator resisted every action of the soft palate against it, and yet it was so closely fitted to it that even fluids could not enter the nasal cavity.

This case confirmed a statement made by the author in a paper recently read before the Royal Medical and Chirurgical Society, upon a somewhat similar case; viz., that, in *accidental* fissure of the hard palate, it needs but that the lost parts be restored mechanically, and the power of articulation is *at once* regained.

NORWICH DISPENSARY.

ANEURISM OF THE ARCH OF THE AORTA.

By PETER EADE, M.D., Physician to the Dispensary.

CASE. S. D., aged 45 years, a well formed and robust looking woman, wife of a labouring man, applied at the Norwich Dispensary in May last, giving the following history of herself. She is the mother of two children; has always enjoyed good health; has not suffered from overwork or privation; knows of no hereditary predisposition to disease; and cannot account for her present illness. In February last, she was suddenly seized with violent pain in the right scapula, extending over a spot about as large as the palm of the hand. This pain came on one day all at once, without her having unusually exerted herself, and without any great mental excitement. Soon after this, she felt pain in the right hand and arm, with some loss of power in the limb, but not of sensation. After another week or two, she suffered from pain in the right collar-bone also. In May, the pains on the right side nearly ceased, but she now complained of pain in the left shoulder, the outer extremity of the left clavicle, and in a spot corresponding to the very apex of the lung. Here it remained for some weeks; and as, at this time, I detected near the base of the heart what appeared to be a to-and-fro or friction sound, I considered the case to be one of rheumatic pericarditis, and the pains in the shoulders to be either sympathetic of this, or themselves also rheumatic. Blisters, opiate liniments,

etc., gave very slight relief; but slight mercurialisation caused a decided remission of the symptoms. On June 23rd, I noted, "Increased action of the heart; double aortic *bruit*; and a pericardial friction sound. The veins on the front of the chest a little enlarged." At this time, neither she nor I had noticed any pulsation in the chest distinct from that of the heart, and I still considered her to be suffering from rheumatism.

I now lost sight of her until the beginning of September, when she again presented herself for relief. She now told me that, since the middle of July, she had been suffering from some difficulty of swallowing, and that she had been gradually getting worse. The beating of the heart (as she considered it) had been increasing, and she had been losing flesh and strength. Latterly, also, her urine had been scanty, her legs had swelled, and she had been unable to lie down in her bed.

Sept. 5th. *Present Condition.* She is much reduced in flesh. Countenance pale, almost sallow; spirits much depressed; legs and thighs very oedematous. She complains of a palpitation or beating in the chest, which is so much increased by any exertion that she is unable to attend to her household concerns. She has pain in the right shoulder, the left having again become free from it; occasionally, also, a little in the right elbow. There is no numbness of the arm or fingers. Sometimes she feels a smarting or sensation of cold on the right side of the head, and occasionally sees sparks of light before her eyes. She suffers from difficulty of swallowing; from inability to lie down in bed; and from dyspnoea, this being rather intermittent than constant. The respiration is wheezing. There is slight cough, accompanied by slight mucous (never bloody) expectoration. The voice is unaffected; urine scanty, with copious deposit of lithic acid gravel; bowels habitually costive.

Physical Examination. Face neither swollen nor livid; no arcus senilis present; pupils natural; extreme distension and dilatation of the right external jugular vein. On the left side, there are two external jugular veins, which are full, but not greatly enlarged. Both carotids throb violently, the right more so than the left. The right lobe of the thyroid gland is slightly enlarged. There is fulness of the superficial veins of the thorax, and to a slight degree of the superficial epigastric veins also. There is no dropsy of the chest, arms, or abdomen, nor any abdominal tumour. Respirations 30; pulse 104. The left radial pulse is fuller and stronger than the right. Both arteries are soft, apparently unossified, and pulsate synchronously. There is no distinct prominence of any part of the chest. The action of the heart is not much greater than natural, but the apical impulse is very slightly increased. On placing the hand upon the upper part of the chest, a strong expansive throbbing is felt, which is most marked to the right of the sternum, about two inches below the clavicle, but is also very evident both under the sternum and to its left side, above the level of the heart. The pulsation becomes less distinct, starting from a point about two inches below the inner end of right clavicle, as the heart is approximated. The impulse communicated to the hand is slightly heaving or expansive, but no vibration or thrill is perceptible. It is synchronous with the systole of the heart, and of about the same force as, or rather greater than, that of this organ in health. There is marked dulness on percussion over the cartilages of the three or four right upper ribs. On listening over this spot, a double sound is heard, as if a small heart were beating under the ear. The first sound is a decided bellows-sound, neither very harsh nor very loud, and gradually diminishing in intensity on approaching the heart. The second sound appears very like to that heard with the diastole of the heart, but does not become louder on nearing the aortic valves. The first sound is heard loud and harsh in the right carotid (much more so, in fact, than over the tumour itself), and very faintly in the left carotid. It can scarcely be said to be audible in the back. A to-and-fro sound, which appears to be produced by pericardial friction, can be heard over the base of the heart. There are no valvular cardiac murmurs. The breathing in the

left lung is rather pronounced. On right side behind, near the root of the lung, it is loud and puerile; and here vocal resonance is much increased.

The *Diagnosis* is now aneurism of the arch of the aorta. I ordered—

R. Tinct. digitalis $\text{m}\times$; potassæ nitratis gr. v; aquæ $\mathfrak{z}\text{i}$. M.
Fiat haustus ter die sumendus.

The diet to be nutritious, but free from stimulants; and all exertion to be avoided.

Sept. 8th. She says that she feels better, and that the beating has been less troublesome to her. But, in spite of this, the disease appears to have made considerable progress in the last few days. There is now a distinct prominence above the sternum, and pulsation can be both seen and felt here very distinctly. This, she says, appeared for the first time this morning. The tumour in this spot is tender to the touch, accompanied by a pricking pain; and the skin covering it is of a pinkish colour. The heart and the subcostal tumour are also beating more forcibly. Pulse 108; respirations 30. Three leeches were ordered to be applied over the sternum.

Sept. 11th. The pulsation of the tumour is less strong, but the heart beats more excitedly. Pulse 120, softer and fuller. The legs are more swelled. She was ordered to omit the nitre and digitalis, and to take the following draught three times a day:—

R. Plumbi acetatis gr. i; aceti destillati $\text{m}\times\text{v}$; tincturæ opii $\text{m}\times$; aquæ $\mathfrak{z}\text{i}$. M.

Sept. 16th. She looks and feels more comfortable, but the tumour has evidently progressed considerably. Pulsations and prominence are now most marked above and to the left of the sternum, the tumour now pointing in the neck. The inequality of the radial pulse is increased. A loud rasping *bruit* is now audible in the right carotid artery, more feebly heard over the apex of the tumour in the left neck, and in the left carotid. A rough *bruit* is also to be heard, and a purring thrill to be felt, to the right of the sternum, below the clavicle, but the second sound formerly heard here is gone. She can swallow better. The pulse is 96 and firmer; and the quantity of urine is much increased.

Sept. 26th. The pulsation of the tumour is less violent. The pulse is now reduced to 84, and is of much better quality. She says she feels "nourished" by the medicine, and thinks it does her a great deal of good. An indistinct murmur, synchronous with the systole of the heart, is audible over the whole of the tumour, but no second murmur is present; only the sound caused (apparently) by the recoil of the tumour. The sound of pulsation, but no *bruit*, can be heard in the back, opposite the third and fourth dorsal vertebræ. The difference between the force of the right and left radial pulse continues to increase. There is constant wheezing dyspnoea; and pain, constant, but neither very severe nor paroxysmal, in the left shoulder. Both the voice and breath sounds are much intensified at the root of each lung.

Oct. 2nd. Yesterday she was suddenly seized with urgent dyspnoea; the breathing being loud, wheezing, and apparently in some degree spasmodic. She coughed a little, but expectorated neither mucus nor blood. Today she is much better again, and looks quite cheerful. The pulsation is much less powerful than it was, the tremor is no longer to be felt, and even the systolic *bruit* can no longer be positively said to be heard. It is doubtful whether any sound exists beyond that produced by the knocking of the tumour against the walls of the chest. She is so well as to create a hope that some favourable change may have occurred within the aneurismal sac.

Oct. 6th. She was again seized last night with urgent dyspnoea, complete orthopnoea, and loud sonorous respiration. To day, these symptoms continue, and there is now a mucous rattle in the chest. The pulse is soft, very feeble, and on the right side extremely small. She has not coughed up any blood. The tumour is pulsating

loudly and excitedly. There is no evidence of its having burst.

The breathing continued gradually to become more difficult and laborious, and she died exhausted in the course of the evening.

Oct. 7th. EXAMINATION OF THE BODY, 24 hours after death.

On raising the sternum, its upper portion was found to be closely connected with the parts beneath; on separating these, partly by tearing and partly with the scalpel, the under surface of the manubrium and adjacent portions of the clavicles and first ribs were found eroded and excavated. The separated soft tissues formed an indistinct mass, which in its most prominent portion, as it lay *in situ*, showed an irregular layer of small blackish clots, which had evidently been in contact with the bone; and on each side of this, some condensed layers of fibrinous tissue. There were about three ounces of yellowish serum in the pericardial sac. The heart was slightly enlarged; near its apex was an oval patch of false membrane, with a long diameter of about one inch and a half. A little fluid black blood was found in its cavities. Its valves were quite healthy. From four to six ounces of fluid were found in each pleural sac. The upper portion of the right lung was adherent in front to the ribs and the adjacent portion of the tumour. The lungs were much congested with dark blood; a small portion of their tissue, close to their roots, was dense and hepatized.

On removing the heart, etc., from the chest, a large false aneurismal tumour was found occupying the whole of the space above the aortal arch. It sprang from the front of the transverse portion of the arch, below and between the giving off of the innominate and left carotid arteries. The sac, formed entirely of the outer arterial tissue, would contain a mass the size of two fists, and was filled in its centre by a large lump of colourless fibrine, apparently of recent formation; its sides were occupied by irregular layers of dirty, semi-organised fibrin; and its upper and front part, in which direction it was evidently extending, contained only the small coloured clots seen when the sternum was first lifted. The opening from the aorta into the sac was transverse, fully an inch long, slightly elliptical in shape, with its greatest depth (about a quarter of an inch) in the centre. Its edges were clean, smooth, and very slightly thickened. The aorta itself was of natural calibre, and undilated at or near the opening. Its lining membrane was quite smooth, without any trace of inflammation, ulceration, or atheromatous degeneration. The trachea was very small, looking as if contracted in its lower part. There was no escape of blood anywhere.

REMARKS. There are two or three points in the history of this case which I think are well worthy of notice, and which must serve as my apology for somewhat minutely detailing its progress. Aneurism of the aorta is a disease which must at all times be fraught with great interest to the practitioner, because of the comparative rarity of its occurrence, and the frequent obscurity as well as variation of its symptoms, not only at its commencement, but also during much of its course; and this interest is greatly heightened by the consideration of the fact, that the disease is all but universally fatal; at the same time that the nature of the lesion, apart from the peculiar vessel involved, would appear not to be such as to render recovery or cure impossible. The disease is, therefore, one which requires close and constant observation.

1. What was the *cause* of the aneurism? The most common causes assigned for it are chronic aortitis, atheromatous degeneration, and laceration from violence. In this case, the entire absence of any signs of inflammation or ulceration, or of earthy deposits in the coats of the aorta, coupled with the cleanly cut edges of the aperture, and the age, etc., of the woman, must go far to negative the supposition of its being due to either of the two former of these causes; and as the opening was in appearance exactly such as would be produced by a crack or slit, it is more probable that it was really a laceration, due to some

forgotten or unnoticed preceding exertion or excitement. The close resemblance of the fissure to one described in a case reported by Mr. Walsh, in the ASSOCIATION MEDICAL JOURNAL of May 10th for this year, in which violent exertion and mental excitement were *known* to have caused the disease, goes far to render this extremely probable, although the exact date or mode of its occurrence cannot be traced. And granting this, it would tend to show, that under favourable circumstances (such as some peculiar position of the body, or some unusual brittleness of the coats of the vessel, or perhaps both combined), a slight and even not unusual amount of exertion may be sufficient to induce this lesion of the arterial wall.

2. As to *diagnosis*. In the first instance, the existence of the pericardial friction sound led me to look upon the pains complained of in the shoulder as either rheumatic or as sympathetic of the inflammation of the heart; and although even at this time they were probably due to the commencing dilatation of the aneurismal sac, yet the co-existence of the circumscribed pericarditis is a fact worthy of notice, and, unless they were simple coincidences, only to be explained by supposing them to be concurrent results of the same cause.

At a later period, viz., in September, a correct diagnosis was more easy, for then the existence of a pulsating tumour within the chest, accompanied by a distinct *bruit*, and causing pressure upon the œsophagus (dysphagia), trachea (wheezing dyspnoea), lungs (increased loudness of respiratory and voice-sounds), superior vena cava (dilated jugulars), right subclavian artery (feeble radial pulse), and right auricle (œdema of legs), naturally led to the conclusion that the case was one of aneurism of the aorta; whilst the bellows-murmur heard over the tumour in front, and not audible behind, coupled with the direction of its extension, indicated that it sprang from the anterior rather than the posterior part of the arch; the partial interference with the right subclavian further tending to localise its origin in the neighbourhood of the innominate artery.

3. The variations in the *physical signs* are worthy of remark, both as being considerable, and as showing how changes in the actual condition of the sac, its orifice or its contents, lead to a corresponding change of or variety in the sounds produced; and serving also to show how little the presence or absence of any one sign is to be relied upon as distinctive of the presence of aneurism. Thus, leaving out of the question the pericardial murmur, in June, a sound resembling a double aortic *bruit* was heard over the base of the heart. On September 5th, a double bellows-murmur was audible in the tumour beneath the cartilages of the second and third right ribs, that accompanying the systole being neither loud nor harsh, and as well as that with the second sound diminishing in intensity towards the heart. On September 16th, the diastolic murmur was gone. The systolic sound had become loud and rasping in character, and a distinct thrill was communicated to the hand placed over the tumour. Ten days later (Sept. 26th), the systolic *bruit* had again become less loud and distinct; and a week after this (October 2nd), its presence at all was doubtful, the purring thrill having also quite disappeared.

Thus there were present in the course of a very few weeks all these varieties of abnormal sound:—1. Pericardial friction. 2. Double murmur over base of heart. 3. Double murmur over tumour. 4. Systolic murmur only, but this loud and rasping. 5. Systolic murmur only, but soft and indistinct in character. 6. Murmurs all absent.

4. Lastly, as to *treatment*. I am very strongly of opinion that the treatment first adopted in this case, viz. by digitalis and nitre, not only did no good, but was productive of positive harm. Very soon after their administration the pulse rose in frequency and diminished in power, whilst the tumour itself rapidly increased in size. Such an effect of lowering remedies in this disease has been pointed out by Dr. Copland in his Dictionary, and, indeed, unless there be excessive action of the heat necessary to be controlled, it seems scarcely rational to adopt empirically means for promot-

ing coagulation in the sac, which physiology teaches us would retard it elsewhere.

The action of the acetate of lead, on the contrary, was of a highly satisfactory nature. Under its influence the pulse fell from 120 to 84; its quality was greatly improved; the violence of the pulsation diminished; the systolic bruit and the purring thrill disappeared; the patient's feelings were greatly improved; and, in fact, the whole prospect had become much more cheering. At this point life was suddenly cut short by the exhaustion consequent upon a prolonged paroxysm of suffocative dyspnoea; this appearing to be in great measure of a spasmodic character, and to be due rather to irritation (? of recurrent laryngeal nerve) than to direct pressure upon the trachea, bronchi or lungs. The actual cause of death was exhaustion from want of sleep, from orthopnoea, and the great labour of respiration, continually increased as this was by the consecutive congestion of the lungs, and perhaps by the presence of serum effused during life into the pleural sacs. Whether the amendment which occurred in the few days immediately preceding death was only illusory, and due rather to a change in the direction of the pressure than to any real improvement; or whether at that time the cavity of the sac had become partially filled by fresh fibrinous clots, it is impossible to say. But at least there was no reason, as shown by the *post mortem* examination, that such should not have been the case, whilst the very nature of the tumour, with its large sac, and its narrow communication with the canal of the artery, afforded the most favourable conditions for such a result.

Hospital Gleanings.

NEW PLASTIC OPERATION IN EXTENSIVE LACERATION AND RUPTURE OF THE PERINÆUM AND PELVIC VISCERA, SUPERVENING ON FRACTURED PELVIS.

A VERY unusual surgical case has been some time in St. Bartholomew's Hospital, which appeared entirely hopeless to many surgeons, until Mr. PAGET, aware of the vast advantages afforded by chloroform, determined, a week since, to operate.

A young man, about two years ago, was rolled over and mangled by the wheel of a wagon. His pelvic bones, Mr. Paget believes, were broken; and, on his recovering from the immediate shock of the accident, it was found that his bladder was torn across, his perinæum laid entirely open, and his rectum also injured and laid bare: in fact, he has been several weeks in St. Bartholomew's, with his perinæum torn completely across from end to end. The case has been several weeks in one of Mr. Paget's beds, and, as might be expected, has excited no little curiosity and attention, as perhaps one of the most extraordinary cases of laceration and destruction, in the male subject, of the recto-vesical septum, on record.

As the perinæum forms a sort of buttress against the downward pressure of the diaphragm on the abdominal viscera, it can be readily conceived, as explained by Mr. Paget to his class, what a serious misfortune this accident must have proved to this young man. The somewhat triangular cavity situated between the bladder and accelerator muscles anteriorly, and the rectum with the levator and sphincter muscles posteriorly, was laid widely open; so that, on Saturday last, when placed, in a crowded operating theatre, under the effects of chloroform, previous to the operation, one could easily recognise all these parts, almost as in a surgical demonstration. As well as the sharpish edge of the torn triangular ligament, the bladder itself was seen,