Remarks on aneurism and diseases of the heart at Aldershot / by Inspector-General Lawson.

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1870

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The admissions and deaths at Aldershot from the various affections comprised in this class, during 1868, are given in the following Table, with the usual millesimal ratios for 1867 and 1868. All the deaths from those which occurred suddenly, out of hospital, have been included (but not in the admissions) to show the total amount of disease among the troops during the year.

Diseases.	1868.		Millesimal Ratios.			
			1867.		1868.	
	Admissions.	Deaths.	Admitted.	Died.	Admitted.	Died.
Pericarditis	2	1	·4	·12	·2	·10
Degeneratio cordis	2	..	..	..	·2	..
Hypertrophia „	9	..	4·1	·12	·9	..
Morb. valv: „	37	5	1·7	·23	3·6	·49
Palpitatio	17	..	·4	..	1·7	..
Angina pectoris	..	..	·2	..	..	..
Syncope	1	2	·1	..	·1	·20
Aneurisma aortæ	16	15	·3	·81	1·6	1·48
„ art. pulmonalis	..	1	..	..	·1	·10
„ carotid inter...	1	1	..	..	·1	·10
„ poplitealis	2	..	..	..	·2	..
Phlebitis..	1	..	..	..	·1	..
Varix	7	..	1·3	..	·7	..
Total	95	25	8·5	1·28	9·4	2·47

This table presents a sudden and remarkable increase of the mortality from diseases of the heart, though their numbers have remained much the same, viz., 6·9 in 1867 against 6·8 in 1868 (including in the latter men who died out of hospital). In aneurism there has been both a large increase in the admissions, and a mortality twice as great as in 1867.

The millesimal ratio of deaths from diseases of the heart and aneurism since 1860, at this station, were as under:—

	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
Diseases of heart.	·19	·69	·56	·49	·62	·60	·50	·47	·79
Aneurism ..	·25	·38	·24	·25	·43	·43	·40	·81	1·68

Thus, with the exception of 1860, the deaths from affections of the heart have not varied very materially, while aneurism was not greatly different up to 1867, when it became doubled, and the high ratio of 1867 was again doubled in 1868.

The first thing that appears on enquiry is that both forms of disease are nearly equally distributed among the mounted corps and the Infantry. Thus, during 1868, there were, including Engineers, Artillery, and Military Train, nine mounted corps in camp for various periods amounting, in the aggregate, to 349 weeks. As the strength of these were not materially different, they may be considered as represented by 6·7 mounted corps for one year. Among these there were three deaths from affections of the heart, and six from aneurism. There were in all 20 Infantry corps in camp for various periods in 1868, giving an aggregate of 528 weeks, equal to 10·2 regiments for one year, among which there were five deaths from affections of the heart, and 11 from aneurism; thus the causes of these diseases operated with much the same force in both classes. In no corps was there more than one death from an affection of the heart, but aneurism was much more unequally distributed, as will appear from the following statement:—

Mounted Corps.

Regiments.	Deaths from Aneurism.	Weeks at Aldershot in 1868.
1st Dragoon Guards	1	33
Royal Horse Artillery	1	53
Royal Artillery	2	53
Royal Engineers	1	53
Military Train	1	53
	6	245
	= 4·7 Corps for 1 year.	

Infantry Corps.

Regiments.	Deaths from Aneurism.	Weeks at Aldershot in 1868.
20th Foot, 1st Battalion ..	1	32
54th „	2	38
80th „	2	36
97th „	2	31
98th „	4	51
	11	188
	= 3·6 Corps for 1 year.	

One of the deaths in the Artillery occurred on the march from Woolwich to Aldershot, but as it was accounted for in the next weekly return from this, it was included with those on the station. The extraordinary fact comes out that though there were an average of 10·2 Infantry regiments at the station for a year, the deaths from aneurism appeared in five of them only, which were together 188 weeks under observation, equal to an annual average of 3·6 corps, scarcely more than the third of the force; and a third of the whole

number were met with in one of these regiments, the 98th. Of the four fatal cases in the latter corps one proved to be of the rare form of aneurism of the pulmonary artery, and another, of the aorta, had been known to be in existence for a considerable period, but as the patient was a well conducted man, of considerable service, he was placed at light duty and kept on togive him the advantage of a pension.

It thus appears that aneurism was not connected with any particular arm of the Service, and, even in the Infantry, was very irregularly distributed. What may have been the cause of the latter peculiarity is difficult to say. Of the five regiments in which it occurred the 1st Battalion 20th, 97th, and 98th Regiments had arrived from Bengal little more than a year previous to their coming to Aldershot, while the 80th came home from the same station a year earlier, and the 54th was at home in 1865. On the other hand, the 34th and 51st, which arrived from Bengal about the same time as the three regiments first named, had no trace of this disease, as well as the other corps recently come home from Malta, Bermuda, Cape, New Zealand, or which had been longer in this country.

As to age, the following were the number of deaths at each year from affections of heart and aneurism :—

Ages.	Diseases of Heart.	Aneurism.	Ages	Diseases of Heart.	Aneurism.
25	1	..	33	..	1
26	1	..	34	..	..
27	2	2	35	1	..
28	1	4	36	..	..
29	..	2	37	..	1
30	1	2	38	..	2
31	..	1	41	1	..
32	..	2			

Of the deaths from cardiac affections, that from pericarditis presented nothing requiring comment. Of the five cases returned as valvular disease, there was incompetency of the tricuspid valves in one, which proved fatal from regurgitation and dropsy in the usual manner ; in three there was some incompetency of the mitral valves and disease and patency of the aortic; in one of these there was one aneurism of the aorta as well ; and in the fifth no details are available. There were two cases returned as dying from syncope. One of these, Private R. Millan, Army Hospital Corps, aged 25, came under treatment on 28th October, 1868, having pricked his finger some days before, while washing the floor of his ward in the North Camp. This caused a painful swelling of the glands in the axilla, and was accompanied by febrile symptoms, with pains in the joints, and on 30th October an erysipelatous affection of the integuments over anterior part of right leg. He was very restless and uneasy during the night of 31st October, and early on morning of 1st November he died rather suddenly. On examining the body a large white coagulum was found in the right side of the heart, extending continuously from the auricle through the ventricle into the pulmonary artery, and nearly filling up the latter. The state of the endocardium was not specially noticed.

The other case reported as proving fatal from syncope was different in its nature, and the cause of death was not obvious. The subject, Sergeant-Major Barnes, Royal Engineer Train, aged 35, a muscular, healthy looking man, was attending the divisional races on 22nd April, and was much interested in the performances of a horse on which he had betted ; he ran towards the winning post to see it come in ; after proceeding about 50 yards he stopped to speak to some one, and while doing so he fell down, and after a few gasps expired. On examining the body, 24 hours after, the superficial veins were found congested. The heart was healthy in appearance, the right cavities full of fluid blood, the left empty. The edge of one of the mitral valves was thickened

The aorta, both thoracic and abdominal, and its valves, healthy. There were old pleuritic adhesions on both sides. The lungs were much congested throughout, but were crepitant, and otherwise healthy. No trace of disease was found in the cerebrum or cerebellum, save a slight fulness of the vessels, and a slightly reddish tinge of the grey matter, but without perceptible softening. The liver, spleen, and kidneys were healthy, but congested. Congestion of the lungs appears to have been the immediate cause of death in this case, but from what cause arising it is difficult to say. The affection of mitral valves seemed insufficient to account for it, even with the excitement the man was under at the time, and no cerebral affection was discovered sufficient to account for the rapidly fatal termination.

In the remarks on the causes of aneurism among the troops in South Africa in the Sanitary Report for the Army for 1866, I stated (p. 554), that phlegmonous inflammation of a limited portion of the coats of the large arteries and veins was by no means rare on that station, and whether by the formation of abscess, as in some instances, or merely by infiltration and softening of the tissues, as seemed to have been the case in others, their elasticity was so reduced that they were unable to withstand the pressure of their contents, and rupture took place, causing death when the surrounding parts did not offer resistance to the escape of a sufficient quantity of blood, and simulating aneurism when this impediment existed. These positions were established by a series of cases in which death had occurred while the vessels were in the conditions mentioned, but it was inferred, from our experience of similar affections in other parts of the system, that such local inflammations might become resolved, leaving, however, a greater or less alteration of texture, and diminution of power of resistance to expansive strain, so that under favourable circumstances a gradual stretching might take place, and an aneurismal sac be formed.

Rokitansky was of opinion that the first step in the production of aneurism was the disease of the inner coat of arteries commonly designated atheroma in this country, though continental pathologists seem to confine that designation to this affection in a subsequent stage, when its deeper layers have undergone fatty degeneration, and the whole begins to break up. This, he says, gives rise to consecutive disease of the circular fibrous coat and cellular sheath (the term circular fibrous coat indicates the middle and cellular sheath the outer coat of the artery), and dilatation begins, sometimes embracing the whole circumference of the vessel, constituting the true aneurism, or proceeding from a limited portion of its walls, and expanding into a pouch of variable size, constituting the saccular form. A secondary dilatation sometimes proceeds from a true aneurism, which assumes the saccular character. (Pathological Anatomy (Sydenham Society edition), Vol. IV., p. 276-8).

With reference to saccular aneurism, he makes the following distinctions :—

"1. In most cases, the wall of the sac at its base near the opening into "the artery, consists of the wall of the artery that has been everted by the "aneurism, and of all the diseased coats of the artery, whilst the circular "margin surrounding the opening is formed by a duplication, as it were, of "the entire wall of the vessel."—"The margins of the opening are smooth and "covered by the deposit; the aperture is roundish."—"This form of aneurism "almost invariably occurs as a secondary formation, being seated on a cylin-"droid or fusiform aneurism.

"2. In some few cases the circular fibrous coat terminates sharply at the "margin of the aperture in the artery. The aperture is irregular and angu-"larly contracted, whilst the wall of the pouch above it consists of the cellu-"lar sheath, and of a deposit which projects from the contiguous inner surface "of the vessel over the margin of the circular fibrous coat in the form of "bridge-like plates and strings, and adheres loosely to the cellular sheath in "the cavity of the expanded portion of the vessel. This appearance is "observed only in small aneurisms, before they exceed the size of a bean or a "hazel nut, and they commonly prove fatal by bursting. They usually occur "as primary aneurisms, and in general in arteries that are only slightly and "locally diseased. The aperture in the fibrous coat is obviously the result of "loss of substance."

"3. In cases of similarly rare occurrence, we meet with a sharply defined "bulging of the artery, filled with the atheromatous mass resulting from the "disintegration of the deposit and the circular fibrous sheath. The wall is "here composed of the cellular sheath."*

Rokitansky considers the aneurism described under the first head "to be "the result of excessive disease of the coats of the artery at a circumscribed "spot. The artery bulges, and its walls then bend at the margin of the "diseased tissue towards the tube of the vessel with which it forms, as it were, "a duplication of the wall of the artery." Further, he says:—"The appear-"ances considered under the second head, have undoubtedly been developed "from those noticed under the third head; at all events we are unable to "discover in what manner this loss of substance has taken place within the "wall of the vessel, unless by the atheromatous process described under the "third head. We find that the deposit and the circular fibrous coat are "affected throughout and destroyed."†

He continues, "We take the present opportunity of answering the question "whether a rent in both the inner coats of the artery can give rise to the for-"mation of an aneurism of this class? The belief in this mode of origin has "met with almost universal accordance, although, as far as we know, the "correctness of the opinion has never been proved by any one. The cavity in "the neck or pedicle of these last named aneurisms has commonly been "regarded as a fissure. Yet, as far as we are aware, no such rent has ever "been detected, nor have we ever found that a fissure in the inner coats of "the artery afforded a basis for the formation of an aneurism."

I have been thus particular in giving Rokitansky's views, as no one would differ from him unless upon the clearest evidence, and I think this evidence is afforded by Clegg's case, detailed in the Sanitary Report of the Army for 1866, p. 552. In that instance there had been recent pericarditis, accompanied or followed by thickening in the coats of the right side of the ascending portion of the aorta within the pericardium, in the centre of which was a cavity, apparently of an abscess. This communicated with the canal of the artery by radiating fissures extending through the middle and inner coats, with abrupt edges, and at a point where there was no trace of atheromatous degeneration on the inner coat. The cavity of the abscess in this case had constituted the sac, which gave way while it was yet of very small size, but had the pericardium been adherent to the surface of the aorta at the part, the sac would have been sufficiently supported to have withstood rupture so early, and have attained a much larger size, as was found inseveral instances here during the year. Had Rokitansky met with a case resembling Clegg's, I cannot but think he would have modified his views as to the immediate cause of aneurism materially, and have given much less weight to atheroma than he has done. It would be going too far, perhaps, to discard the influence of this degeneration altogether, but certainly aneurism, as I have met with it among soldiers, seems frequently to exist quite independent of that form of disease of the inner coat of the arteries, and destruction of large portions of even the whole three coats may take place by an acute process, and without a trace of atheroma in the neighbourhood, as is clear from the following case:—

Private John Almond, 80th Regiment, aged 28, 10 years' service, was admitted to hospital on 8th April with inflamed tonsils, accompanied by considerable febrile excitement. The left was most affected. Matter formed in it, and on the 11th was evacuated by a natural opening in the anterior part of the tonsil, after which the febrile disturbance disappeared. On 15th at 6·30 A.M., while getting up, he was in high spirits, and, while talking to those about him, a gush of blood came from his mouth; this was florid, and a large quantity escaped, causing faintness. Cold water was applied to the chest and spine, and ice given in small quantities frequently during the day. There was no recurrence of bleeding until the morning of the 16th, when he got up contrary to order, and it returned, and he lost nearly a pint, which came away in gushes, not by vomiting or coughing. Perfect quiet was now maintained, and ice kept constantly in the mouth, and he went on favourably until the 21st, when at

* *Ibid.*, page 280–81. † *Ibid.*, page 281.

3·50 P.M. a violent gush took place, and though pressure was made over the carotid immediately, he died in five or six minutes.

The last attack was preceded for a little by a peculiar sensation in the region of the heart, which induced the patient to think the bleeding was about to recur. On examination the cavity of an abscess was found behind the superior constrictor of the pharynx, about the size of a filbert; this had opened into the pharynx behind the velum by a small aperture; on the other side it communicated with the canal of the internal carotid, the coats of which were destroyed for nearly half an inch in length, and about a fifth of its circumference in width, at a point just before it turns to enter the carotid foramen of the temporal bone. The edges of the opening in the carotid were irregular, abrupt, and thickened as if they had undergone inflammation and ulceration. From what we know of the resistance of the coats of the larger arteries to ulceration, even when passing across an eroding sore or abscess, it appears reasonable to conclude that the vessel in this case was itself originally implicated, and that the resulting abscess opened through the muscle, and not that an abscess first arose there which ultimately led to the destruction of the coats of the vessel. It was a question whether the common carotid should be tied in this case; the difficulty in finding where the blood came from, and its intermittent flow, however, led to its not being done, and after death it became clear that even had the operation been performed, the bleeding most likely would have recurred, owing to the free anastomosis of the vessels inside the cranium, affording a copious supply of blood, which the large breach in the carotid would have permitted it to escape on the first excitement.

In the following case there were two aneurisms, which clearly came under Rokitansky's second division, at the same time that there was thickening of the whole circumference of the vessel, and several commencing dilatations that would come under his first division, but without atheromatous degeneration at the spot.

Private Edwin Fowler, Military Train, aged 31, service nine years, healthy in appearance, steady, temperate, and with great muscular development, went to hospital on 18th November complaining of pain between the scapulæ, which had been increasing for some days, but without cough or acceleration of pulse. Nothing unusual was discovered in the condition of the lungs, heart, or great vessels, nor was there any tenderness in the course of the spine. About 2 P.M. he become rather collapsed, with great uneasiness deep in chest, which gradually extended downwards, and at last was referred to the epigastrium. This was attended with much restlessness, and inability to remain in any particular position; breathing deep and sighing, pulse small and slightly accelerated, and latterly there was a feeling of sickness at stomach, and a sensation as if the bowels were to be moved, but nothing was passed either way. In this condition he died at 4 P.M. On examining the body the coats of the aorta at the commencement of the descending portion were found thickened for between two and three inches, and this embraced its whole circumference. On laying open the vessel at this place, two small aneurismal pouches were found about its centre, and at the inner and back part of the vessel. These were near each other, and had openings about the third of an inch in diameter, with smooth but mamillated edges. The smaller sac was about half an inch deep with its inner surface entire. The other, which could have contained a walnut, adhered to the vertebra at the back, and had given way at the lower part, and permitted extensive effusion of blood into the posterior mediastinum, both upwards, and downwards as far as the diaphragm. At several other points inside the thickened portion were slight, nearly circular, depressions of the surface, showing the resistance of the coats to the pressure from within had been insufficient, and that other pouches were commencing to form. The lining membrane of the vessel displayed moderate traces of atheromatous degeneration, many patches of which had become perforated with numerous openings, as is usual when they are wasting, but the depressions of surface above noticed were free from atheroma in any of its stages. The heart was healthy in size and appearance. The tricuspid and mitral valves were quite healthy. The aortic had slight thickening towards the edges, but were smooth and healthy in appearance otherwise.

This case shows that the inflammation which precedes the formation of

aneurism may embrace the whole circumference of the vessel, and hence affords an explanation of those varieties of the disease denominated true aneurism, in which the calibre of the vessel is suddenly increased without the formation of a distinct pouch on one side, communicating with the canal of the vessel by an opening more or less contracted. Three such examples were met with among the fatal cases in the course of the year; in one of them, Gunner Martin Henley, Royal Horse Artillery, who died on 7th September, the immediate cause being pleuro-pneumonia of left side, the aorta was dilated into a large pouch without any clot in it, and without any distinct sac. In the second, that of Private J. Miller, Military Train, who was also affected with disease of, and incompatency of the mitral and aortic valves, the aorta, after giving off the left subclavian, suddenly expanded into a pouch about 2½ inches in diameter, and circumscribed portions of the walls of this again were commencing to be dilated so as to present a number of secondary pouches; there was no trace of fibrinous deposition in any of these. There was very little trace of atheromatous degeneration in this case; the immediate cause of death was congestion of the lungs. In the third case, that of Private Blake, 98th Regiment, the aorta, about the commencement of the arch, was dilated uniformly to the size of a cricket ball, the inner surface smooth, and without any deposit of fibrine. There was much atheromatous disposition between the heart and sac, some of it calcified. The tricuspid valves were much thickened and incompetent, also the aortic, and the heart enlarged. The case proved fatal through congestion of the lungs and dropsy. The man's condition had been detected in India when he presented himself as a volunteer, and to the last he stated he felt no inconvenience from it.

Occasionally an instance is met with of a distinct aneurismal sac, combined with a general dilatation of the vessel at another part in the vicinity, as in the following case, which presented both features, and with a complete absence of the atheromatous deposit.

Private Joseph Abbot, 54th Regiment, aged 32 years, ten years' service, died of aneurism on 18th June. This had made its appearance a considerable time before, but being on Staff employ he did not report himself until 10th May, when it had caused absorption of the sternal ends of the second and third ribs on right side, and protruded externally. While in hospital the tumour extended up the neck as far as the thyroid cartilage, and ultimately caused absorption of the clavicle. The skin over the upper part of the tumour became thinned, inflamed, and threatened to ulcerate, when he died from exhaustion. The sac arose from the superior portion of the arch of aorta, by a large opening; it was nearly filled with concentric, and firm layers of lymph; it had given way at one point, and from this the blood escaped which had extended through the areolar tissue along the neck, here there was no attempt at fibrinous deposition. The innominata was pervious and healthy, the left carotid obliterated at its origin. The aorta was much dilated between the heart and the sac, and its inner coats puckered, thickened, and rough, but presented no trace of atheroma. The heart and valves were healthy.

In addition to the cases already alluded to, there were four in which sacs of some size had formed within the pericardium, and ruptured into the cavity, in all of which this membrane was adhering firmly over most of the surface of the sac; in one of these there was a second sac outside the pericardium. In another case, that of Private Neighbour, 97th Regiment, who died from exhaustion without rupture, a large sac sprang from the anterior part of the arch of the aorta, and another, the size of a walnut, was formed between the aorta and pulmonary arteries and upper part of the right auricle. It communicated with the aorta by a smooth circular opening that would admit a swan quill, half an inch above the valves. The sac was firm, and contained many layers of fibrine which almost filled its cavity, it was, in short, undergoing a spontaneous cure. Another case had a sac at the commencement of the arch, which burst into the right pleura. In another there was a large sac at the arch which did not give way, but the patient died of exhaustion. In another, a sac at the end of the arch ulcerated into the æsophagus, and after death the stomach and duodenum were found distended with blood, though none had been passed from the mouth. In another there were two sacs at the commencement of the descending aorta, one of which burst into the posterior medias-

tinum, the blood passed downwards as far as the crura of the diaphragm, and then into the right pleura, which contained numerous large clots. In another there was aneurism involving the cœliac axis, which burst into the peritoneum. Of these ten cases there was no atheromatous degeneration in the inner coats of the aorta in three, and in one only were the aortic valves diseased. In five others the condition of the inner coat was not specially noticed ; two of these only had disease of aortic valves. In two there was much atheroma, but in both the aortic valves were healthy.

There was one case in which an aneurism arose from the bottom of the sulcus behind the anterior aortic valve, and the sac was formed in the left ventricle, by the endocardium with a few muscular fibres adhering to it, and the upper part of the septum. The cause of death in this case was peculiar, and as there was another presenting much the same characters, but without complication with aneurism, it may be useful to bring both together here.

Private Thomas Pope, 1st Battalion, 20th Regiment, aged 27, service eight years, was orderly to Assistant Quartermaster-General since 10th June. He complained latterly his duties exposed him to the sun, and were harassing. For a short time before his death he seems to have felt much uneasiness in cardiac region, and to have dreaded ascending the hill from the east Infantry block to the Quartermaster-General's Office (about 70 feet elevation). On the evening of 29th February he complained of pain in the region of the heart with palpitation, but next morning took his breakfast heartily, and went to the office. At the usual hour he dined, and shortly before 2 P.M. was sent a message, when he fell down, but immediately after was able to walk to hospital with the assistance of a comrade. At half-past 2 P.M., Dr. Carter saw him, when he complained of pain in cardiac region, with great difficulty of respiration, with slight cough, and much moist crepetation over lungs. Pulse very feeble, temperature of surface natural. At a quarter to 3 P.M. the breathing was much more laborious, and there was profuse expectoration of frothy fluid, slightly tinged with blood. At 3 P.M. he was insensible, collapsed, pulse scarcely to be felt, and the froth oozed up into the mouth, and passed out of the nostrils in very large quantities ; he had previously spat a quart into the vessel at the bedside. Sinapisms were applied to the chest, and æther, camphor, and brandy given freely, and latterly Silvester's method of restoring the drowned was employed, but without effect, and he died at 3·35 P.M. The fluid expectorated was alkaline with a number of blood corpuscles in it. It consolidated with nitric acid. Hydrochloric acid was not tried with it. As already stated, an aneurismal sac was found at the upper part of the septum in the left ventricle, this was about the size of a walnut, and had no deposit of lymph in it. When full the sac could not have been emptied during the period of contraction of the ventricle, and as it was protruding over the passage to the aorta, must have impeded the flow of blood into that vessel very materially. The valves and lining membrane of the aorta were healthy. The lungs were much congested, almost hepatized, and the bronchial tubes full of fluid.

The other case was that of Private A. Holdgate, 54th Regiment, which was returned as pulmonary apoplexy. This man, aged 32, was stout, muscular, short necked, and had 14 years' service. On 31st July, after dinner, while employed on fatigue duty, he felt unwell suddenly, and was removed to hospital on a stretcher at 4 P.M. He was then in a low prostrate condition, with irregular intermittent pulse, and continued in this state until about 8 P.M., when cough, dyspnœa, and frothy expectoration came on, and the latter soon presented an admixture of blood. By 11 P.M. the chamber pot was half filled with a thin serous-like fluid, frothed on the surface like soap suds. As this coagulated firmly with nitric and with hydrochloric acids, it was evidently chiefly serum, with but little mucus in it. The dyspnœa at 1 A.M. was extreme, with great thirst, the stomach rejecting everything as soon as swallowed. Pulse 120, temperature 56. Shortly after three the cough and expectoration gradually ceased. At 7 A.M. he became insensible, and died about three quarters of an hour afterwards. At first a mustard emetic was given, and a large sinapism applied to the chest, and ammonia and æther frequently administered. After the cough commenced turpentine fomentations to back and front, with the stimulants and brandy, were employed assiduously,

and warmth applied to the feet. The body was examined 10 hours after, when the rigor mortis was well marked, and there was considerable livor of the back (depending) parts. White froth issued freely from the mouth and nostrils, and on compressing the thorax a continuous stream welled up. On incising the skin the veins bled freely. The heart was somewhat hypertrophied and dilated, valves healthy, walls with a good deal of fat. Right side full of fluid blood. Left ventricle contained a feebly coloured clot attached to its anterior wall. Right pleura firmly adherent throughout. Trachea and bronchial tubes full of frothy serum. Lungs, especially right, much congested, but every portion floated in water. No other indication of disease in them.

The symptoms in the first of these cases might have been attributed to the impediment to the circulation caused by the aneurism, but for the immediate occurrence of the other in which no such obstruction existed; it seems very probable, however, that the extremely rapid course of the disease in Pope was determined by this complication. The weather had been very hot up to 22nd July; on 23rd the maximum was 72·4° only, and it was not above 80° for the rest of the month, except on 27th and 28th, when it rose to 89·4 and 85·4 respectively, but on 29th was 72·8 only. The excessive discharge of serous fluid from the lungs bears some analogy to what is described as occurring occasionally in sun-stroke, but (independently of the cases occurring after the temperature was much reduced) it was not preceded or accompanied by the dryness and excessive heat of skin, or by the other symptoms characteristic of that disease. There was a disposition to cholera at the time these cases presented themselves, and, on 13th August, a man of the 2nd Battalion 6th Regiment actually died of that disease. I am not aware that a connexion can be established between them, but in the absence of any trustworthy explanation of the causes of the former the coincidence may be mentioned.

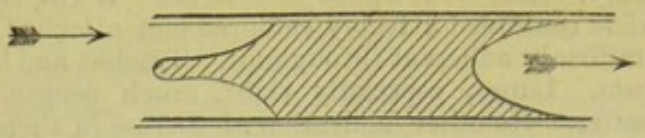
There was an instance of aneurism of the pulmonary artery, a very rare form of disease, and the first I have heard of in the Army. This occurred in Schoolmaster Sergeant James Thane, 98th Regiment, aged 27, who had complained of hoarseness and occasional dyspnæa for about six months before death, but for which no perceptible cause had been detected. On 2nd September he was found dead in bed, his head hanging over the side, and a large pool of blood on the floor that seemed to have flowed from the mouth and nose. An aneurism of the pulmonary artery, the size of a pigeon's egg, was found, which had burst into the left bronchus, by a circular opening two lines in diameter. The sac contained dense layers of fibrine. The bronchial tubes on the same side were filled with blood, but the lungs were otherwise healthy, and there was no valvular disease of the heart,

There were two cases of popliteal aneurism under treatment, which were cured by pressure, and both men have since returned to duty. The subject of one of them was Troop Sergeant-Major Henry Wadeson, 10th Hussars, aged 30, and with 13 years' service, a stout healthy looking man. His horse fell with him at the Curragh on 6th May. Immediately after he marched for Aldershot, and on 12th he felt a sharp pain in left ham, with stiffness of limb, but he continued with his troop until he reached this station. On 7th he came to hospital, with a well defined aneurism as large as a hen's egg; pressure was applied to the femoral artery in front of the thigh, and the pulsation ceased in 70 hours. The limb remained stiff and weak for some months, but he has latterly been able to resume his mounted duties.

The other case of popliteal aneurism occurred in Private J. Dillon, 97th Regiment, aged 30, and 10 years' service, eight of which had been in India. This man was healthy in appearance, but of intemperate habits. He was admitted on 8th November with aneurism in left ham the size of a hen's egg; he had experienced stiffness, numbness, and cramps in the leg for a fortnight before, but was not aware of having injured it in any way. Pressure was applied over the femoral artery in front of thigh, and continued with intermissions until the 20th, when the pulsation ceased, and the swelling then diminished rapidly. The man was discharged to duty on 8th December, and has continued at it since, unless when in confinement.

During the year there was an opportunity of examining the condition of the artery in a man who had had aneurism at the junction of external iliac and femoral on left side, some years before, which had been cured by the

pressure of a 4 lb. weight over the femoral below its site, while on detachmen in New Zealand. The subject, Private Charles Carlton, 43rd Regiment, died of dropsy, depending on tricuspid incompatency, on 27th March. The canal of the artery was completely obstructed under pouparts ligament, for about 1¼ inches in length, by a firm fibrous material in this manner—



The coats of the vessel could not be separated from this plug on the one hand, nor from the sheath on the other, the whole being matted together by extremely firm fibrous tissue. There were no distinct remains of a sac perceptible.

From the above details I think it may be concluded that when the dilatation of the vessel is uniform, embracing all its coats, there is little or no chance of fibrinous deposition, and of a natural cure; but, on the other hand, unless secondary sacs form, the simple dilatation seems not disposed to extend indefinitely, and to involve risk to life, so that such cases, as instanced in Private Blake, 98th Regiment, may run on for a long period without the individual experiencing much inconvenience, and even allowing of his undergoing considerable exertion if the heart be not affected.

As soon as a distinct sac is formed, whether directly from the artery, or from a true aneurism, there is a tendency to the deposition of fibrine, and under favourable circumstances as to rest and diet, that will proceed quickly and may ultimately lead to a complete cure. In the case of Boddy, 54th Regiment, the deposition of fibrine was particularly rapid after he was placed in bed, and the size and pulsation of the tumour diminished, and, had the sac not given way so as to permit of extravasation along the neck there seemed every hope of a cure. The case of Neighbour, 98th, in whom a small sac, within the pericardium, was almost completely filled with dense fibrine, shows that even in that most dangerous situation a cure is not to be despaired of. Of course the facility for deposition, and the probability of a cure, will be greater when the opening into the sac is small than when it embraces a larger portion of the calibre of the vessel. When the arterial coats have given was by a rent, and the blood is effused into the neighbouring parts without the intervention of a sac, the chances of a cure, unless the artery itself be secured both above and below the part, are extremely small. Rokitansky indeed says, that inflammation of these sometimes ensues, leading to a deposition of fibrine around the extravasation, and so forming a sort of a sac, but this occurs so rarely that the probability of its taking place in any given instance cannot be regarded as of any practical value.

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