Aneurysms of the aorta : being an exercise for an act for the degree of M.D. in the University of Cambridge / by Oswald A. Browne.

ANEURYSMS OF THE AORTA

BEING

AN EXERCISE FOR AN ACT FOR THE DEGREE OF M.D.
IN THE UNIVERSITY OF CAMBRIDGE

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"Of all books and of all studies, those are most calculated to promote the business of clinical observation which are especially conversant with the nature of morbid processes."

P. M. Latham: *Lectures on Clinical Medicine.*

"May not that which frequently has been instruct us as to what will be?"

R. Southey: *The Doctor*, clxx.

ANEURYSMS OF THE AORTA.

Some years ago I had the honour in this place of submitting to the late Regius Professor of Medicine, whose gracious presence will ever be held in affectionate remembrance by all his old pupils, an exercise upon the subject of Aneurysm of the Aorta based upon a careful analysis of 88 such cases that had died in St. Bartholomew's Hospital during the seventeen preceding years. The thesis received his kind approval, and was published at his request.

The inferences therein recorded have stood the test of clinical experience in the hands of myself and others during the intervening years, and it has seemed to me that it may be worth the while, and even desirable, to return to the subject, and to make a further survey with more mature experience and upon a wider range of facts. I do so in the hope of showing that we may approach the difficult question of the differential diagnosis of these diseases with a far greater measure of certainty than has been commonly supposed.

The remarks that follow are based upon an analysis of all cases of aneurysm of the aorta, in any of its parts, dying in St. Bartholomew's Hospital during the last thirty years, upon whom an examination was made after death, and its results carefully recorded. They number 173 in all, and bear date from October, 1867, when such records were there systematically made and kept for the first time, and include all such cases so examined up till May 31 in the present year, 1897.

With a view to ascertaining how far the aorta is the artery most frequently involved in this disease, and the relative degree of its incidence upon other arteries of the body, I have drawn up a table (appended) of all cases of aneurysm, of whatever artery, that have been *under treatment* in the hospital during the thirty years now under consideration.

The table shows that, with an annual average total of 5,000 in-patients, there were under treatment during these thirty years in all 631 cases of aneurysm. In 468 of these the disease affected the aorta in one or other of its parts, the popliteal artery being next in the scale of incidence, but affected in 80 cases only. There were 21 cases of aneurysm of the femoral artery, 1 of the femoralis profunda, 14 of the subclavian, 8 of the innominate, 8 of the carotid, and 6 of the external iliac artery. A large proportion of the remaining cases were evidently of traumatic origin.

It should be noted how very rare is aneurysm of the innominate artery. The tables that follow will further show how very rarely this vessel is involved in aneurysm affecting the ascending or transverse portions of the arch of the aorta.

For greater convenience in analysis, and in the general arrangement of the obtained results, I have observed the ordinary anatomical divisions of the artery into ascending, transverse, and descending portions of the arch, the descending thoracic, and the abdominal aorta, saving that I have made the third or descending portion to commence at a line drawn at right angles through the place of origin of the left subclavian artery upon its distal side, the point at which the artery first commences to assume a directly downward course. These divisions can only be considered as of convenience, and it is not possible in exactness to draw any so hard and fast a line between the various portions of the artery.

There occurred 58 cases of aneurysm of the ascending portion, and of the transverse portion 35, of the ascending and transverse portions combined 19, of the descending portion of the arch 21, of the descending thoracic aorta 17, and of the abdominal aorta 23.

Taking these cases *en masse*, a few remarks will commonly apply. Of the 173 cases, 153 occurred in men, 20 in women. The ages were distributed as in the appended table. 113 of the cases occurred between the ages of 35 and of 55 years; only one case had occurred before the age of 25 years.[1]

TABLE OF AGE.

15 to 25		25 to 35		35 to 45		45 to 55		55 to 65		Over 65		Total.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
—	1	26	3	57	10	41	5	16	1	2	—	143*	20
				113									

* The age was unrecorded in the case of 10 males.

In almost all, the disease occurred in an artery in greater or less degree enfeebled by atheromatous disease. The valves of the heart were healthy in 117 cases, the aortic valves incompetent in 21 only. There had been some degree of cardiac hypertrophy in 72 cases; in 92 cases there was no hypertrophy.

Taking now each division of the artery separately, I shall first carefully describe the anatomy of the part, for in the close study of the relative anatomy of the aorta lies the true key to the diagnosis of the disease. The results obtained by analysis of the cases in the appended tables will then be recorded, and I shall leave to a later moment the gathering together of the inferences derived.

I am fully alive to the many fallacies that beset the statistical method, and would, for the purposes of this essay, make my own the words of the late distinguished President of the Royal College of Physicians: "By statistical information we may point out the direction in which truth lies, and *may approximate an accurate statement of certain facts;* by percentages we may eliminate errors, and convey some fraction of the truth; but the truth itself, the principle, or law, cannot be converted into figures; it lies beyond them, *is an inference from them*, and is subject to no exceptions and no change."[2]

[1] A girl, aged 15 years. See Table I., Case 28.

[2] "Essays and Addresses," by Sir J. Russell Reynolds, Bart., F.R.S. (Lond., 1896), p. 18.

THE FIRST OR ASCENDING PORTION OF THE ARCH.

This portion of the arch measures about $2\frac{1}{4}$ inches in length. Arising from the left ventricle, it lies behind the middle of the sternum on a line with the lower border of the third left costal cartilage, and is separated from the lower half of the upper third of the sternum only by pericardium and the approximated edges of the lungs. It passes upwards and to the right, as high as to the level of the upper border of the second right costal cartilage, taking an oblique direction behind the sternum and approaching to within a quarter of an inch of that bone. For the greater part of its course it is enclosed in a tubular sheet of pericardium common to it and to the pulmonary artery, both vessels being so covered, except where in contact the one with the other.[1]

At its commencement it is in contact anteriorly with the right auricular appendix and the pulmonary artery. As it passes to the right, the pulmonary artery comes to lie upon its left side, together with a portion of the left lung.

On the right side lies the vena cava superior, whilst behind are the several structures forming the root of the right lung.

Of 58 cases of aneurysm of this part of the arch, 50 occurred in men and 8 in women; 37 of the cases occurred between the ages of 35 and of 55 years.

TABLE OF AGE.

15 to 25		25 to 35		35 to 45		45 to 55		55 to 65		Total.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
—	1*	8	0	17	4	13	3	8	—	46	8
				37							

* A girl, aged 15 years (Table I., Case 28). The ages of four men were unrecorded.

The artery was atheromatous in 50 of the cases, and highly so in 17. All the valves of the heart were healthy in 35 cases; in 9 only were the aortic valves noted as incompetent. There had been some degree of hypertrophy of the left ventricle in 28 cases; in 26 cases there was no hypertrophy.

Position.

With regard to the exact position of the aneurysm, 24 of the cases occurred *immediately above the valves*. Of these cases, five had ruptured into the pericardium,[2] four had pressed upon the pulmonary artery,[3] three had compressed the vena cava superior,[4] in one case opening into it near the heart (Case 8).

The remaining 34 cases occurred at a distance of one inch or more from the valves, and it was not uncommon to find dilatation of the artery from its commencement to the point of origin of the innominate artery,[5] or even extending beyond the origin of the left subclavian artery.[6] *The innominate artery had been involved in two cases only.*[7] In eight instances there had been

[1] The pericardium envelops the great vessels for about 2 inches from their origin from the base of the heart.—*Gray.*

[2] Table I., Cases 11, 19, 32, 42, 44.

[3] Table I., Cases 16, 20, 25, 46.

[4] Table I., Cases 8, 16, 19.

[5] Table I., Cases 23, 45, 51, 55, 57.

[6] Table I., Cases 4, 9, 10, 11.

[7] Table I., Cases 26, 57.

more than one aneurysm present,[1] whilst in one of these it was remarkable that in the same artery no fewer than six aneurysmal dilatations had occurred.[2]

Main direction.

The larger number of the aneurysms arose from the right or from the dextro-anterior aspect of the arch, being situated partly within and partly outside of the pericardial sheath, and the general direction taken by almost all was *markedly to the right side*. Those that reached the chest wall, and presented anteriorly, did so usually to the right of the sternum in the second and third (less often the fourth) right costal interspaces, or over the sternum[3] at this level,[4] eroding usually one or more of the second, third and fourth right costal cartilages or ribs,[5] and that part of the sternum that lay adjacent to them.[6]

Presentation to *left* of sternum.

In four instances an aneurysm of this part of the arch had presented to the left of the sternum.[7]

In Case 3 (Table I.) the heart and pericardium were pushed down to the left; the left side of the manubrium had been eroded, as also the cartilages of the second and third left ribs with the sternum thereto adjacent.

In Case 26 the tumour was adherent to the chest wall from the third left rib upwards. The left lung was retracted and adherent to the back of the tumour. The caliber of the main pulmonary artery and of its left branch were narrowed. The left vagus nerve had also been compressed.

In Case 45 the tumour occupied the upper and front part of the left chest. The heart had been pushed downwards; the sternum adjacent to the first, second and third left ribs had been eroded.

Case 51 is very remarkable, and deserves special mention.[8] During life "a low rounded smooth tumour was felt stretching from the second to the fifth ribs on the left side between the sternum and the nipple line. This tumour pulsated in a manner quite unlike the pulsation of the heart, and altogether like the pulsation of an aneurysm. The protuberance and pulsation were greatest in the third interspace. The position of the heart could not be ascertained. There was nothing like a cardiac impulse anywhere; there was no dulness to percussion to the right of the sternum; there were no signs of compression of any of the structures within the thorax." At the examination post-mortem: "When the integuments were raised from the ribs, there was a perforation of the intercostal muscles about the size of a shilling in the fourth left interspace, just internal to the nipple and external to the costo-chondral joint. The under surface of the fourth rib close to this joint was much eroded for an inch and a half; the third rib likewise for about an inch. On removing the ribs there appeared, in what should have been the situation of the heart, a sac containing a soft gelatinous coagulum, no doubt a clot formed since death; adherent to one part of the sac was a small quantity of old fibrinous deposit. A considerable portion of the front wall of the sac was necessarily removed with, and indeed was formed by, the eroded ribs and the intercostal muscles. The heart was much displaced, so as to lie almost wholly to the right of the middle line, being pushed horizontally over to the right without the apex being tilted upwards or downwards. The finger could be

[1] Table I., Cases 1, 2, 14, 19, 26, 30, 39, 56.
[2] Table I., Case 2.
[3] Table I., Cases 4, 6, 9, 14, 22, 24, 31, 37, 38, 47, 58.
[4] Table I., Cases 24, 33, 57, 58.
[5] Table I., Cases 4, 6, 9, 24.
[6] Table I, Cases 3, 4, 18, 24, 33, 57, 58.
[7] Table I., Cases 3, 26, 45, 51.
[8] This case is recorded at length by Dr. Gee in the St. Bartholomew's Hospital Reports for 1894, vol. xxx., p. 1. From this account my notes are taken.

passed through the aneurysmal sac into the left ventricle. The sac lay obliquely between the second right and the fifth left costo-chondral joint for a length of 6½ inches. Upwards, in the middle line, the sac reached the level of the first rib. Immediately above the sac, and lying on it, were the two innominate veins. No natural aorta was visible. Laying the sac open, it was found to be formed by a dilatation of the whole of the ascending part of the arch, from the sigmoid valves to the mouth of the innominate artery. The pulmonary artery was natural, and lay altogether behind the sac. The right ventricle of the heart was of natural size, the walls very thin, and the muscular substance rather pale. The left ventricle was of natural size, the walls flabby and wasted. The tricuspid, mitral, and pulmonary valves were natural. The aortic orifice, natural in size, opened straight into the aneurysm. Beyond the innominate orifice the aorta was natural, except that it was very slightly atheromatous. The bronchi were not compressed."

Dr. Gee, in recording the case, remarks: "Those aneurysms of the ascending part of the arch which come to the surface, and give rise to a tumour upon the front of the chest, spring from the right or convex side of the vessel, and tend, as they enlarge, towards the right. Exceptions to this rule must be very uncommon." He quotes a saying of Oppolzer ("Vorlesungen," vol. i., p. 290), the only reference to a state of things contrary to that above mentioned that he had been able to find, "that as to the situation of the tumour to the right of the sternum, this is undoubtedly the rule in the majority of instances, inasmuch as the aneurysms arise likewise, as a rule, from the convex side of the aorta. But in exceptional cases they spring, not from the convex, but from the concave wall of the aorta, and then the said tumour is found not on the right, but on the left side of the sternum."

In Case 26 it is especially noted that the aneurysm was of the *anterior* part of the arch. I have been unable to ascertain whether the aneurysm arose from the concavity of the arch in any of the three remaining cases.[1]

Effects of pressure.

The structures most commonly subjected to pressure were the vena cava superior[2] and the pulmonary artery.[3] In six cases the right lung was adherent to or formed part of the wall of the tumour.[4] The venæ innominatæ (Case 7), the vena cava inferior (Case 17), the trachea (Case 11), and the right bronchus (Case 36), had each in one case been compressed. In one instance only (Case 37) had any of the dorsal vertebræ been eroded. Here the sac of the aneurysm was adherent to the spinal column, and the second and third dorsal vertebræ had been deeply eroded.

[1] Whilst writing, a very interesting case of aneurysm, which bears upon this point, has come under my notice at the Metropolitan Hospital.

During life there were evident signs of compression of the superior vena cava, indicating the probability that the ascending portion of the arch was affected. There was no external tumour, but some degree of dulness was present and obvious pulsation felt, in the second and third *left* costal interspaces.

At the examination post-mortem it was found that a wide-mouthed saccular aneurysm arose from the *concave* side of the ascending portion of the arch, the origin, though of considerable longitudinal extent, being limited to the concave and inner aspect of the arch. The aneurysmal sac projected mainly to the left and forwards. A small diverticulum extended from the main sac to the right, passing behind the ascending portion of the arch, and compressing the superior vena cava. The diagnosis of an aneurysm of the first part of the arch (because compressing the superior vena cava), and (because presenting to the left of the sternum) arising probably from the *concavity* of the arch, would here have been entirely correct.

[2] Table I., Cases 1, 4, 7, 8, 16, 17, 19, 31, 54.

[3] Table I., Cases 7, 16, 17, 20, 25, 26, 29, 46, 50.

[4] Table I., Cases 9, 14, 24, 31, 47, 49.

Termination.

The disease had terminated by *rupture* in 18 cases ; in nine instances into the pericardium,[1] in four into the right pleural cavity.[2] In two cases the aneurysm had ruptured externally,[3] and once into the right lung,[4] and pulmonary artery[5] respectively. In only one instance (Case 45) had rupture taken place into the left pleural cavity.

THE SECOND OR TRANSVERSE PORTION OF THE ARCH.

Having reached the level of the upper border of the second right costal cartilage, the course of the aorta alters, and it passes now upwards and backwards and obliquely from right to left, to the left side of the body of the third dorsal vertebra. This is the ordinary termination observed by the anatomists, but I have made this tranverse portion to end, as I think it more truly does, at a line drawn at a right angle to the aorta through the place of origin of the left subclavian artery upon its distal side. The upper part of the arch is on a level with the lower border of the second dorsal vertebra, and is distant usually about an inch and a half from the upper border of the sternum, lying, at the right border of the sternum and to the inner side of its junction with the second right costal cartilage, at from three-quarters of an inch to one inch behind that bone. In its course it passes directly in front and to the left of the trachea, the œsophagus, and the thoracic duct, and arches over the left bronchus.

The convex upper border is in close relation with the left innominate vein, whilst from it pass off the three main arterial trunks.

Its lower concave border overhangs the bifurcation of the pulmonary artery, and is connected with its left branch by the remains of the ductus arteriosus, this part of the arch being crossed in front and towards the left side by the left pneumogastric and phrenic, with cardiac branches of the sympathetic nerves.

The left recurrent laryngeal nerve winds round it and passes upwards beneath and behind it. The left pleura and lung cover it to the left.

Of 35 cases of aneurysm of this portion of the arch, 29 occurred in men, and 6 in women. The ages are given in the appended table, in which it will again be noticed how large a proportion of the cases occurred between the ages of 35 and of 55 years.

TABLE OF AGE.

25 to 35		35 to 45		45 to 55		55 to 65		65 to 75		Total.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
8	—	11	4	6	1	1	1	1*	—	27	6
		22									

* Aged 66 years. The age was unrecorded in the case of two males.

The artery was atheromatous in 28 cases, and highly so in 10. In 25 cases the valves of the heart were healthy ; in 3 only were the aortic valves incompetent. There had been some degree of cardiac hypertrophy in 14 cases ; in 19 there was no hypertrophy.

[1] Table I., Cases 11, 19, 32, 39, 41, 42, 44, 53, 55.
[2] Table I., Cases 5, 6, 9, 47.
[3] Table I., Cases 38, 43.
[4] Table I., Case 49.
[5] Table I., Case 29.

Position.

The aneurysm arose most often (and in about the same number of cases) from the commencement[1] or from the middle[2] of this portion of the arch, having origin more often from the posterior[3] than from the anterior[4] or upper[5] surface of the vessel. In four cases the aneurysm arose near to the point of origin of the left subclavian artery,[6] and in three instances involved the whole of the transverse arch;[7] in three cases it involved both the transverse and descending portions of the arch.[8]

Great vessels.

The innominate artery was involved in six cases,[9] the sac being in one case (Table II., Case 9) formed by great distension of the posterior wall of the artery at its origin. In three instances the right carotid and subclavian arteries sprang directly from the sac of the aneurysm.[10] It was very rare for either the left carotid or subclavian artery to be involved. These arteries were each so involved in one case only.[11]

There had been more than one aneurysm in seven instances.[12] In Case 4 three distinct aneurysms had occurred. The first arose from the posterior part of the arch where the aorta is in closest relation with the trachea; a second arose from the anterior wall just below the origin of the innominate artery; whilst a third had its origin below and to the left of the larger aneurysm. In Case 21 an aneurysm projected from the arch anteriorly and slightly to the right, just below the origin of the innominate artery; a second projected backwards from the arch below, just above the origin of the left subclavian artery.

Direction taken.

The direction most commonly taken appears to have been *directly backwards*, and in 13 cases there had occurred a greater or less degree of pressure upon the trachea,[13] attended often by erosion of its cartilaginous rings.[14] In a large number of cases the direction taken was *upwards and to the right towards the surface*, presenting either above the episternal notch,[15] or lying just behind the first bone of the sternum[16] and eroding it,[17] and presenting either there[18] or (more commonly) in the first and second right costal interspaces.[19]

Presentation to *left* of sternum.

In four instances only had the aneurysm presented to the *left* of the sternum.[20] In these the external tumour was situated to the left of the sternum over the second, third or fourth left costal cartilages.

Effects of pressure.

The trachea was commonly subjected to pressure.[21] The left bronchus was more or less compressed in three instances,[22] and in three instances the left recurrent laryngeal nerve had

[1] Table II., Cases 1, 6, 7, 8, 20, 23, 24, 25, 31, 34.
[2] Table II., Cases 4, 5, 10, 11, 12, 13, 18, 26, 27, 28.
[3] Table II., Cases 2, 4, 9, 16, 17, 18, 30, 31, 34.
[4] Table II., Cases 1, 23, 26.
[5] Table II., Cases 27, 28.
[6] Table II., Cases 2, 3, 15, 16.
[7] Table II., Cases 17, 19, 35.
[8] Table II., Cases 14, 22, 32.
[9] Table II., Cases 8 to 13 inclusive.
[10] Table II., Cases 8, 10, 11.
[11] Table II., Cases 29 and 33.
[12] Table II., Cases 1, 4, 13, 20, 21, 30, 34.
[13] Table II., Cases 4, 9, 10, 11, 13, 14, 16, 21, 23, 25, 28, 31, 35.
[14] Table II., Cases 4, 10, 11, 13, 14, 16, 21, 25, 35
[15] Table II., Cases 11, 24, 27.
[16] Table II., Cases 5, 23, 30.
[17] Table II., Cases 1, 12, 19, 24, 26.
[18] Table II., Case 19.
[19] Table II., Cases 17, 19, 24, 26, 31.
[20] Table II., Cases 1, 19, 26, 33.
[21] See Note 13 above.
[22] Table II., Cases 14, 15, 20.

been compressed and flattened.[1] The left innominate vein was much compressed in two cases;[2] in one (Case 6) there had been some degree of pressure upon the vena cava superior. In four instances only had any of the dorsal vertebræ been eroded.[3]

Termination.

Death was commonly due to asphyxiation caused by increasing pressure of the aneurysm upon the trachea.[4] The disease terminated by rupture in twelve cases; in no case into the right, in three cases into the left pleural cavity;[5] in three into the left bronchus;[6] in two into the trachea;[7] in two into the pericardium;[8] in one into the œsophagus.[9] In one case only had the aneurysm ruptured externally.[10]

In the case of a woman, aged 60 (Case 7), rupture had taken place through the inner and middle coats of the vessel, at the origin of the innominate artery, the external coat being quite separated from the middle coat, with blood-clot intervening; final rupture had taken place into the pericardium at the right of the aorta, just where it arose from the heart. In Case 24 death was due to great œdema of the aryteno-epiglottidean folds, entirely closing the orifice of the larynx. In two others tracheotomy[11] had been performed for the relief of urgent dyspnœa without associated physical signs.

ANEURYSMS OF BOTH THE ASCENDING AND TRANSVERSE PORTIONS.

Of such cases there were 19 instances. They appear to form a distinct and fairly numerous group. 18 occurred in men, one in a woman.

TABLE OF AGE.

25 to 35		35 to 45		45 to 55		55 to 65		Total	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1	—	4	—	6	1	5	—	16	1

The ages of two males were unrecorded.

Position.

The artery was atheromatous in 16 cases, and highly so in 8. In 14 cases the valves of the heart were healthy; in one only were the aortic valves incompetent. There had been some degree of cardiac hypertrophy in 8 cases; in 10 there was no hypertrophy.

Great vessels.

The whole of the ascending and transverse portions were commonly involved, from close above the valves to beyond the origin of the left subclavian artery.[12]

It was rare for the large vessels to be involved in the sac of the aneurysm.[13] The large vessels arose from the sac in two instances.[14] In one (Table III., Case 15), the innominate and left carotid arteries so arose, the left subclavian artery being free. In one (Case 4) there was a

[1] Table II., Cases 9, 10, 31.
[2] Table II., Cases 8, 11.
[3] Table II., Cases 15, 29, 32, 33.
[4] Table II., Cases 4, 9, 10, 11, 14, 16, 17, 18, 21, 23, 25, 28, 31, 34, 35.
[5] Table II., Cases 2, 3, 32.
[6] Table II., Cases 12, 20, 33.
[7] Table II., Cases 8, 27. In Cases 11 and 13 the aneurysm was on the point of rupture here.
[8] Table II., Cases 5, 7.
[9] Table II., Case 29.
[10] Table II., Case 26.
[11] Table II., Cases 9, 16.
[12] Table III., Cases 2 to 17 inclusive.
[13] Great vessels normal, Table III., Cases 2, 7, 8, 9, 12, 14, 17, 18; probably also in Cases 1, 3, 6, 10, 13, 19.
[14] Table III., Cases 5, 11.

funnel-shaped dilatation of the left subclavian artery for an inch and a half from its origin. Second aneurysms had occurred in three cases.[1]

Direction taken.

The projection of the aneurysm was usually either *directly upwards*,[2] or *upwards and to the right*,[3] the tumour lying either behind the first bone of the sternum[4] or presenting in the first and second right costal interspaces,[5] eroding the right border of the sternum[6] and the second and third right costal cartilages,[7] or the attachments of the upper two or three ribs on the right side.[8]

In Case 17 the main direction taken was forwards *to the left*, the sac of the aneurysm being adherent to the left border of the sternum. During life there had been felt a pulsating tumour to the left of the sternum over the second, third, and fourth left costal interspaces. The second, third, and fourth left costal cartilages had been eroded. The disease terminated by rupture into the left pleural cavity, an earlier rupture having taken place into the upper lobe of the left lung. In this case alone had an aneurysm of this nature presented externally to the left of the sternum.

Effects of pressure.

There had been marked compression of the trachea[9] in four instances; in three, of the left bronchus,[10] the rings of the left bronchus being eroded in Case 8, whilst in another case (Table III., Case 10) the sac of the aneurysm abutted closely on the left bronchus, and perforating ulceration had taken place between the left bronchus and the œsophagus. In one case only[11] had any of the dorsal vertebræ been eroded. In this case the two upper dorsal vertebræ were eroded on the right side.

Termination.

Death was commonly caused by asphyxiation due to increasing pressure of the aneurysmal sac upon the trachea;[12] in one of these cases tracheotomy had been performed.[13]

The disease terminated by rupture in four instances: once into the right lung,[14] once into the right pleural cavity,[15] once into the left pleural cavity,[16] and once into the trachea.[17] In Case 8 the left bronchus had been compressed, and the aneurysm was upon the point of rupture there. In Case 10, also, the aneurysm closely abutted on the left bronchus, and ulceration had taken place between the left bronchus and the œsophagus.

THE THIRD OR DESCENDING PORTION OF THE ARCH.

At the orifice of the left subclavian artery commences the third change in the general direction of the aorta, which now takes a course downwards and to the left, reaching the spinal column at the left side of the body of the third dorsal vertebra, and passes thence, in a straight course downwards, to the level of the lower border of the fourth dorsal vertebra.

It is covered anteriorly by the left pleura and root of the left lung. To the right side lies the œsophagus, with the thoracic duct; to the left is the left pleura and lung.

Of aneurysm of this part there were 21 cases; 18 occurred in men, and 3 in women.

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[1] Table III., Cases 14, 18, 19.
[2] Table III., Cases 1, 2, 3, 9.
[3] Table III., Cases 4, 5, 6, 11, 13, 14, 15, 16, 18, 19.
[4] Table III., Cases 4, 5, 7, 10, 14, 15, 16, 18.
[5] Table III., Cases 4, 5, 6, 7, 14, 15, 16, 18.
[6] Table III., Cases 4, 5, 7, 10, 14, 15, 18.
[7] Table III., Cases 4, 7, 11, 15, 16, 18.
[8] Table III., Cases 5, 6, 12, 13, 14, 18.
[9] Table III., Cases 1, 3, 4, 19.
[10] Table III., Cases 2, 8, 10.
[11] Table III., Case 4.
[12] Table III., Cases 1, 4, 7, 9, 14, 15, 16, 18.
[13] Table III., Case 9.
[14] Table III., Case 13.
[15] Table III., Case 6.
[16] Table III., Case 17.
[17] Table III., Case 19.

TABLE OF AGE.

25 to 35		35 to 45		45 to 55		55 to 65		65 to 75		Total.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
2	1	9	2	4	—	2	—	1	1	18	3
		15									

The artery was atheromatous in 18 cases, highly so in twelve. The valves of the heart were healthy in fifteen cases; in two instances the aortic valves were noted as being incompetent. There had been some degree of cardiac hypertrophy in ten cases, whilst in a like number there was no hypertrophy.

Position. Direction taken. Erosion of vertebræ.

In eleven of the cases the aneurysm occurred either at[1] or just below[2] the origin of the left subclavian artery. The direction commonly taken was *to the left and backwards*, the aneurysm coming to lie to the left of the spine in the interscapular region,[3] and eroding two or more of the bodies of the dorsal vertebræ,[4] the third, fourth, fifth and sixth vertebræ being those most commonly involved.[5] The upper part of the left lung was adherent to, or formed part of the wall of, the aneurysm in seven cases.[6] In three cases there had been extensive associated destruction of the ribs.[7] In Case 10 (Table IV.) an aneurysm of this part of the arch lay against the third and fourth dorsal vertebræ. The bodies of these vertebræ, as also the fourth left rib, it had eroded, and thus had projected as a tumour visible in the back. The spinal canal lay open to the thorax, and the spinal cord was compressed. The dura mater of the cord was entire, and the spinal cord itself was not softened.

Effects of pressure.

The œsophagus had in five instances been subjected to pressure.[8] There had been pressure upon the left bronchus in four instances;[9] in three upon the trachea;[10] in one the left recurrent laryngeal nerve had been more or less compressed;[11] in one the left pulmonary artery had been compressed and flattened.[12]

Termination.

The disease had terminated by rupture in 16 instances. In eight cases into the left pleural cavity;[13] in three into the œsophagus;[14] in three into the left bronchus;[15] and once into the right pleural cavity[16] and right lung[17] respectively.

In Table IV., Case 6, the aneurysmal sac, having origin just below the left subclavian artery, bursting downwards, had dissected the mucous from the muscular coat of the œsophagus, as far as the upper border of the diaphragm, where blood had flowed through a small orifice into the left pleural cavity.

[1] Table IV., Cases 4, 18.
[2] Table IV., Cases 1, 2, 3, 6, 7, 8, 12, 13, 21.
[3] The scapula extends from the level of the second to that of the seventh dorsal vertebra. See Holden's "Landmarks," p. 26.
[4] Table IV., Cases 1, 3, 4, 5, 8, 10, 11, 13, 18, 19, 20, 21.
[5] Table IV., Cases 1, 3, 4, 8, 9, 10, 11, 18, 19, 20, 21.
[6] Table IV., Cases 2, 7, 8, 9, 10, 11, 15.
[7] Table IV., Cases 1, 9, 10.
[8] Table IV., Cases 3, 4, 6, 16, 18.
[9] Table IV., Cases 4, 19, 20, 21.
[10] Table IV., Cases 3, 18, 21.
[11] Table IV., Case 13.
[12] Table IV., Case 20.
[13] Table IV., Cases 1, 6, 7, 8, 9, 11, 14, 15.
[14] Table IV., Cases 3, 5, 16.
[15] Table IV., Cases 13, 19, 20.
[16] Table IV., Case 12.
[17] Table IV., Case 17.

THE DESCENDING THORACIC AORTA.

From the lower border of the fourth dorsal vertebra, the aorta passes with a slight inclination from left to right (and therefore presenting towards the right a slight convexity), and with but little variation of caliber, to the opening between the crura of the diaphragm opposite to the twelfth dorsal vertebra, lying there in nearly the middle line of the body.

It is placed near against the vertebræ, and closely follows the bend of the spine, having a concavity forwards in the dorsal region, and being comparatively fixed in position by the several intercostal branches given off from it on either side.

Placed anteriorly to it above are the left bronchus, left pulmonary artery, and the posterior part of the pericardium, whilst the œsophagus, which above has been lying to the right, passes, opposite to the tenth dorsal vertebra, to lie upon the artery.

Close to it on the right are the azygos vein, thoracic duct, and the œsophagus (above), the left lung and pleura being to the left.

Of aneurysm of this part of the aorta there were 17 cases, all of which occurred in men.

TABLE OF AGE.

25 to 35		35 to 45		45 to 55		Total.	
M.	F.	M.	F.	M.	F.	M.	F.
3	—	4	—	8	—	15	—

The ages of two men were unrecorded.

It is perhaps worthy of notice that eight of the cases occurred between the ages of 45 and 52 years.

The artery was atheromatous in sixteen cases, and highly so in six. The valves of the heart were healthy in 12 instances; in 2 only were the aortic valves noted as incompetent.

There was some degree of cardiac hypertrophy in four cases; in thirteen there was none.

Position.

The larger number of the aneurysms occurred within a few inches of the passing of the aorta between the crura of the diaphragm into the abdominal cavity,[1] the aneurysm being generally situated either upon or, more usually, to the left of the bodies of the lower dorsal vertebræ.[2]

Effects of pressure.

Erosion of vertebræ.

In almost every case there had been great pressure exerted against two or more of the lower dorsal vertebræ, which in five instances[3] formed the posterior wall of the aneurysm. The *lower four* dorsal vertebræ were those most commonly eroded;[4] and in two instances[5] there had been extensive associated destruction of the ribs. In one of these cases (Table V., Case 2) the neighbouring ribs had been necrosed and broken, two inches of each having entirely disappeared, and the tumour had caused compression of the spinal column. In both instances a tumour had become visible externally in the back to the left of the spine.

[1] Table V., Cases 2, 3, 6, 8, 9, 15, 17.
[2] Table V., Cases 1, 2, 3, 5, 8, 9, 10, 12, 13, 14.
[3] Table V., Cases 1, 3, 10, 13, 14.
[4] Table V., Cases 1, 2, 3, 8, 9, 12, 13, 14.
[5] Table V., Cases 2, 5.

In Table V., Case 1, the degree of pressure exerted had been so great that incipient lordosis had occurred. The œsophagus passed over the wall of a smaller sac, and a communication existed between it and the sac. The vena azygos and thoracic duct had been obliterated.

In Table V., Case 10, the œsophagus was compressed.

Termination.

In no fewer than fourteen out of the seventeen cases rupture had occurred. In seven cases into the left pleural cavity;[1] twice into the right pleural cavity;[2] thrice into the œsophagus;[3] once into the left bronchus;[4] and once into the subserous connective tissue lying to the right of the spinal column.[5]

In more than one case it was noticeable how great had been the extent of the cavity of the aneurysm.[6]

In five instances more than one aneurysm had occurred.[7]

THE ABDOMINAL AORTA.

After passing through the crura of the diaphragm, the aorta appears in the abdomen on the front of the last dorsal vertebra, and, descending a little to the left side of the vertebral column, divides into the common iliac arteries opposite to the middle of the fourth lumbar vertebra. As it descends it diminishes rapidly in size, and describes a slight curve with convexity forwards, the greatest convexity being opposite to the third lumbar vertebra. It is attached and relatively fixed to the left side of the bodies of the first four lumbar vertebræ.

Its anterior surface is in approximation successively with the pancreas, splenic vein, left renal vein, and peritoneum, the cardiac portion of the stomach lying near to it on the left side.

To the right side is the vena cava inferior, the right crus of the diaphragm being interposed above. The thoracic duct and azygos vein are in close proximity on the same side.

Of aneurysm of the abdominal aorta there were twenty-three cases. Of these twenty-one occurred in men, and two in women. The ages are given in the appended table.

TABLE OF AGE.

15 to 25		25 to 35		35 to 45		45 to 55		Total.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1	—	4	2	12	—	4	—	21	2

This table shows a somewhat striking uniformity in age. As many as twelve occurred between the ages of 35 and of 45 years. Six occurred at the age of 39, two at the age of 40 years.

The artery was atheromatous in 18 cases, and highly so in five. The valves of the heart were healthy in 16 cases; in four the aortic valves were noted as incompetent. In eight instances there had been some degree of cardiac hypertrophy; in fourteen there was no hypertrophy.

Position.

There was marked uniformity also in the position of the aneurysm. In one it occurred as the artery lay between the crura of the diaphragm;[8] *fourteen sprang from it immediately*

[1] Table V., Cases 4, 8, 9, 12, 13, 15, 16.
[2] Table V., Cases 6, 14.
[3] Table V., Cases 1, 7, 17.
[4] Table V., Case 11.
[5] Table V., Case 3.
[6] Table V., Cases 2, 5, 8, 13, 14.
[7] Table V., Cases 3, 7, 11, 15, 16.
[8] Table VI., Case 1.

beneath the diaphragm;[1] six, either opposite or just below the cœliac axis;[2] one arose midway between the left renal artery and the bifurcation of the aorta into the two common iliac trunks;[3] and one from the posterior wall of the abdominal aorta in its lower part.[4]

Direction taken.

In nine instances a pulsating tumour had been felt during life in the epigastric region of the abdomen.[5] In four cases such a tumour had been felt in the left hypochondriac region;[6] twice in the left lumbar region;[7] once in the right iliac and right lumbar regions.[8] In seven cases there had been no external tumour.[9]

Erosion of vertebræ.

In ten instances the upper lumbar vertebræ had been eroded;[10] the three first lumbar vertebræ being those most commonly so affected.[11]

Termination.

Of the twenty-three cases, twenty had terminated *by rupture*, no fewer than eleven bursting into the retroperitoneal connective tissues on one side or other of the spine.[12] Of these, one (Table VI., Case 2), arising just below the cœliac axis, had burst first into the retroperitoneal connective tissues, and later through a rent in the diaphragm into the left pleural cavity; another (Table VI., Case 3), arising midway between the left renal artery and the bifurcation of the aorta into the common iliac trunks, had apparently burst first into the substance of the left psoas muscle, and had finally made its way through a rent in the peritoneum covering the rectus muscle into the general peritoneal cavity.

In four instances rupture had taken place into the general peritoneal cavity;[13] in two into the left,[14] in two into the right pleural cavity.[15] In Table VI., Case 18, the aneurysm had ruptured into the duodenum.

GENERAL CONCLUSIONS.

"Even in things alike there is diversity, and those that do seem to accord do manifestly disagree."[16] The truth of this old saying must in a striking degree have been set forth by what, I fear, has been a somewhat tedious enumeration of observed facts derived from the careful and laborious analysis which has formed the basis of the present essay. It has been my endeavour to lay before you "an accurate statement of certain facts." There remains to me the task of endeavouring to gather together "the inferences to be derived from them," which form the nearer expression of the unvarying and abiding truth.

The facts recorded seem to me fairly to justify the following conclusions:

Aneurysms of the aorta.

I. That aneurysm affects the aorta far more commonly than all the other arteries of the

[1] Table VI., Cases 4, 5, 6, 7, 8, 9, 10, 12, 14, 18, 19, 20, 21, 23.
[2] Table VI., Cases 2, 11, 13, 15, 16, 22.
[3] Table VI., Case 3.
[4] Table VI., Case 17.
[5] Table VI., Cases 2, 4, 7, 14, 15, 17, 18, 19, 22.
[6] Table VI., Cases 5, 9, 10, 11.
[7] Table VI., Cases 3, 17.
[8] Table VI., Case 16.
[9] Table VI., Cases 1, 6, 8, 12, 13, 20, 21.
[10] Table VI., Cases 3, 5, 8, 9, 12, 13, 16, 17, 21, 23.
[11] Table VI., Cases 8, 9, 12, 13, 17, 23. Probably also Cases 3 and 5.
[12] Table VI., Cases 1, 2, 5, 8, 13, 14, 15, 16, 17, 21, 22.
[13] Table VI., Cases 3, 7, 11, 19.
[14] Table VI., Cases 9, 10.
[15] Table VI., Cases 4, 12.
[16] Sir Thomas Browne's "Religio Medici," edited by W. A. Greenhill, M.D. (Lond., 1881), Part II., p. 96.

body combined,[1] and that the ascending and transverse portions of the arch are those (by far) most commonly affected.[2]

Aneurysm of the innominate artery.

II. That aneurysm of the innominate artery is extremely rare ;[3] and that it is also very rare for this vessel to be involved in aneurysm affecting the ascending or transverse portions of the arch,[4] or for the other large arterial trunks to be involved in the sac of an aneurysm affecting these portions of the arch.[5] The aphorism that "we much more often meet with uncommon forms of common diseases than with uncommon diseases" is one which it is well constantly to bear in mind.

Aneurysms of the first or ascending portion of the arch.

III. That aneurysms of the *first or ascending part of the arch* arise with great frequency either immediately above the valves, or at a distance of one inch or more therefrom, more often from the right or dextro-anterior aspect of the arch, and take a direction markedly to the right, presenting externally to the right of the sternum in the second and third (less often the fourth) right costal interspaces, eroding those costal cartilages with the adjacent sternum ; that such aneurysms occasionally, but very rarely, are found presenting to the *left* of the sternum ; that the vena cava superior and the pulmonary artery are the structures most frequently subjected to pressure by aneurysm of this part; that the disease terminates frequently by rupture into the pericardium or into the right pleura, and that external rupture is a rare occurrence.

Aneurysms of the second or transverse portion.

IV. That aneurysms of the *second or transverse portion of the arch* arise with frequency either from the commencement or from the middle part of the transverse portion, and usually from the posterior wall, and that they commonly take a direction either directly backwards, compressing the trachea, or upwards, to the right, and towards the surface, presenting either beneath the first bone of the sternum or in the first and second right costal interspaces ; that such aneurysms sometimes present to the left of the sternum, but that such an occurrence is rare ; that the innominate artery is seldom, the other large arterial trunks but very rarely, involved in the disease ; that the trachea is the structure far most frequently subjected to pressure, with occasional added compression of the left recurrent laryngeal nerve ; that it is very rare for any of the dorsal vertebræ to be eroded ; that death is most commonly caused by asphyxiation due to increasing pressure of the aneurysm upon the trachea, or by rupture of the sac, and that such rupture most commonly occurs into either the trachea, left bronchus, or left pleural cavity.

Aneurysms of both ascending and transverse portions.

V. That aneurysms *involving both the ascending and transverse portions of the arch* form a fairly numerous and defined group ; that the whole of these two portions of the arch are commonly involved, and that it is rare for the large arterial trunks to be involved in the aneurysm ; that the direction taken is usually either directly upwards or upwards and to the right, the tumour lying either behind the first bone of the sternum or presenting in the first

[1] Out of a total of 631 cases, 468 involved the aorta.

[2] Of the 173 cases here analysed, 112 involved the ascending or transverse portions of the arch.

[3] Occurring in 8 only out of a total of 601 cases of aneurysm.

[4] It was so affected in 9 only out of a total of 112 cases involving these portions of the arch.

[5] In 7 only out of 112 cases recorded.

and second right costal interspaces; that the trachea and left bronchus are more commonly compressed than other structures; and that death is commonly caused by asphyxiation due to increasing pressure of the aneurysm upon the trachea or left bronchus.

Aneurysms of the third or descending portion of the arch.

VI. That aneurysms of the *third or descending portion of the arch* commonly arise either at or just below the place of origin of the left subclavian artery, and take direction to the left and backwards, lying to the left of the spine in the interscapular region, eroding two or more of the upper dorsal vertebræ (most commonly the second to the sixth, inclusive), compressing the left lung, and that such aneurysms commonly terminate by rupture into the left pleural cavity.

Aneurysms of the descending thoracic aorta.

VII. That aneurysms of the *descending thoracic aorta* arise commonly within a few inches of the passing of the aorta through the crura of the diaphragm into the abdominal cavity, and lie generally either upon or to the left side of the bodies of the lower dorsal vertebræ, eroding, almost always, two or more of these lower dorsal vertebræ (most commonly the lower four), and that they terminate with great frequency by rupture of the sac, most commonly into the left pleural cavity.

Aneurysms of the abdominal aorta.

VIII. That aneurysms of the *abdominal aorta* arise with great frequency immediately below the diaphragm, and commonly erode one or more of the three upper lumbar vertebræ; that if they present externally they do so most commonly in the epigastric or left hypochondriac region; and that they terminate with very great frequency (and not uncommonly at about the age of forty years) by rupture of the sac into the retroperitoneal connective tissues, or into the general peritoneal cavity.

Condition of the heart and of its valves.

It is further to be noticed, that in considerably less than half of the cases had there been any degree of hypertrophy of the heart,[1] and that in twenty-one only out of the one hundred and seventy-three cases recorded were the aortic valves noted as being incompetent.

Statistics of cardiac hypertrophy.

Part of Aorta.	*No. of Cases.*	*Hypertrophy occurred in*	*No Hypertrophy in*
Ascending part of arch	58	28	26
Transverse part of arch	35	14	19
Ascending and transverse (combined)	19	8	10
Descending part of arch	21	10	10
Descending thoracic aorta	17	4	13
Abdominal aorta.	23	8	14
Total	173	72	92

Statistics of termination by rupture.

The statistics of termination by rupture are very remarkable, and should, I think, be appended:

Part of Aorta.	*No. of Cases.*	*Terminated by Rupture.*
Ascending portion of arch	58	18
Transverse portion of arch	35	12
Ascending and transverse (combined)	19	4
Descending portion of arch	21	16
Descending thoracic aorta	17	14
Abdominal aorta	23	20

The external rupture of an aneurysm is a very rare occurrence.[2]

[1] In only 72 out of the 173 cases had there been any degree of hypertrophy.

[2] In three cases only out of 173 cases recorded. See Table I., Cases 38 and 43; Table II., Case 26.

It will be noticed how largely increased a proportion of the cases have terminated by rupture of the sac, where the descending portion of the arch, the descending thoracic aorta, or the abdominal aorta, have been affected.

"The tendency of the present day," writes Sir Russell Reynolds,[1] "is to ignore causation and give up the question 'Why?' and this because some, in endeavouring to supply an answer, have given falsehood instead of truth." With such thought in my mind, I almost hesitate to hazard an explanation of this fact.

It may be that in aneurysm of the ascending and transverse portions of the arch the contiguity of neighbouring firmer structures acts as a support to the sac, and that gradual constant pressure here results in slow erosion of bone or gradual compression of neighbouring structures, whilst in the later cases the sac, being unsupported, tends to early rupture.

It has been of set purpose that in these pages conjecturings and opinions of my own have found no place; for I hold with strong conviction that it is by these that the science of medicine is "more professed than laboured, more laboured than advanced." I have set before myself the humbler task of striving in one small corner to stay the stream of clinical material that, as it seems to me, is for ever running to waste in our Hospital, and of giving honest diligence to the patient study and sifting of accurately ascertained facts, that these may speak for themselves, that so *θεωρία* may be "no more than an exact description of Nature and of fact."

"Sic *me* scientem non faciunt libri
Et dogma pulchrum, sed sapientia
Enata rebus, mensque facti
Experiens, animusque felix."[2]

[1] "Essays and Addresses," p. 20.

[2] Lines by Edward Hannes, the friend of Addison, in his verses on Sydenham.

APPENDIX OF THE CASES,

ARRANGED IN A TABULAR FORM.

"Facilius discimus quæ congruo dicuntur ordine quam quæ sparsim et confusim."

ERASMUS.

PREFATORY NOTE.

The 173 cases recorded in the following tables are taken from the first twenty-four volumes of the Register of Post-mortem Examinations of St. Bartholomew's Hospital, and cover a period of thirty years, the date of the earliest case (Vol. I., p. 11) being the 1st of October, 1867, that of the latest (Vol. XXIV., p. 120) the 31st of May, in the present year, 1897.

A few cases were of necessity omitted from the tables, as being, for my purpose, inadequately noted.

These cases are below indicated :

Volume viii.	-	-	page 55.
,, xi.	-	-	,, 353.
,, xv.	-	-	,, 350.
,, xxii.	-	-	,, 104.

For the benefit of any who may in the future take interest in this subject, I have further appended a table of references to the cases *as recorded in the ward note-books of the Hospital*, in so far as I have been able to ascertain the same. These notes have all been examined for the purposes of the present essay.

I would express my deep sense of gratitude to Dr. Calvert and Dr. Archibald Garrod (the Medical Registrars), and to Mr. James Berry (the Surgical Registrar of the Hospital), for the ready access to the registers and ward note-books that has been accorded to me, and for many added kindnesses.

O. A. B.

October, 1897.

LIST OF TABLES.

APPENDIX OF THE CASES.

TABLE A.

A TABLE OF REFERENCE TO CASES OF ANEURYSM OF THE AORTA, AS RECORDED IN THE POST-MORTEM REGISTERS AND WARD NOTE-BOOKS OF ST. BARTHOLOMEW'S HOSPITAL (1867 TO 1897).

Reference to Post-mortem Registers.	Name.	Reference to Ward Note-books.	Remarks.
I. 11	Matthias Tyler.	Matthew.	No notes extant.
I. 127	Henry Wise.	Luke.	No notes extant.
I. 201	Isaac Frankland.	Matthew.	No notes extant.
I. 217	Henry Daniell.	Matthew.	No notes extant.
I. 242	Thomas Smith.	Luke.	No notes extant.
I. 244	Arthur Burke.	Mark.	No notes extant.
I. 257	Alfred Hyatt.	Luke.	No notes extant.
I. 286	James Shuter.	Matthew.	No notes extant.
I. 307	George White.	Luke.	No notes extant.
I. 333	Leonard Francotte.	Mark.	No notes extant.
II. 51	George Leslie.	—	Brought in dead.
II. 69	Peter Reid.	Luke.	No notes extant.
II. 78	John Rudland.	Matthew, i. 267.	
II. 127	William Reeves.	—	Brought in dead.
II. 173	Mary Farrell.	—	Brought in dead.
II. 190	Thos. Goldsmith.	Luke, Jan.-July, 1871, p. 142.	
II. 227	John Feely.	Radcliffe, July - Dec., 1871, p. 1.	
II. 247	John Bowdler.	—	Brought in dead.
II. 260	Thomas Hayward.	Luke, June-Oct., 1871, p. 71.	No notes of value.
II. 303	Henry Alger.	Matthew, ii. 185.	No notes.
II. 308	—	—	Brought in dead.
II. 341	Benjamin Cormack.	Radcliffe.	No notes extant.
III. 48	Robert Conning.	Luke.	No notes extant.
III. 237	Wm. Luckett.	Matthew.	No notes extant.
III. 262	Wm. Goldsmith.	John.	No notes extant.
III. 313	Robert Collins.	—	Brought in dead.
IV. 90	Andrew Riddell.	Luke, Oct., 1873, p. 92.	
IV. 114	Richard Woodcock.	Radcliffe.	No notes extant.
IV. 133	Francis Mornington.	—	Brought in dead.
IV. 160	Elizabeth Williams.	Hope, iv., p. 146.	No notes of value.
IV. 194	James Baker.	Luke.	No notes extant.
IV. 336	Wm. Henry Lee.	Matthew, iv. 210, 365.	
IV. 364	James Bigwood.	Mark, v. 203.	
IV. 375	Alfred Abbott.	Matthew.	See *Med. Times and Gazette*, July 30, 1875.
IV. 377	John Cousins.	Radcliffe, 1874, p. 100.	
IV. 399	John Broadstock.	—	Brought in dead.
IV. 409	James Shaw.	Mark, v. 155.	
V. 19	Wm. J. F. Morgan.	Mark, v. 182, 313.	
V. 97	Ann West.	Hope, v. 282.	
V. 117	Edward Skinner.	Mark, v. 212; vi. 1.	
V. 137	Catharine Theobald.	Hope, v. 127.	
V. 173	Susannah Feathers.	Hope, v. 123, 331.	
V. 241	Eva Sutton.	Faith.	No notes extant.
V. 262	Mark Moss.	Luke, June, 1876, to March, 1878, p. 37.	
V. 275	Henry Watts.	Matthew.	No notes extant.
V. 296	John Bunting.	John, iv. 282.	
V. 337	Wm. Warwick.	Mark, vi. 219.	
V. 345	Isaac Barker.	Mark, vi. 258.	No notes of value.
V. 365	Geo. Berwick.	Mark, vi. 318.	No notes of value.
VI. 24	Elizabeth Monday.	—	Brought in dead.
VI. 133	Catherine Walker.	—	Died in surgery.
VI. 179	John Wren.	—	Died in waiting-room.
VI. 350	Richard Warin.	Casualty.	No notes extant.
VI. 374	William Price.	Luke, ix. 217.	
VII. 21	Jane Owen.	Hope, vii. 294.	
VII. 87	George Day.	Matthew.	No notes extant.
VII. 189	James Libby.	Mark, viii. 210.	
VII. 253	John Meesen.	Mark, viii. 232.	
VII. 259	Joseph Higgins.	Matthew, vii. 247.	Moribund on admission.
VII. 273	Edward Jones.	—	Brought in dead.
VII. 277	James Redding.	—	Brought in dead.
VII. 293	Richard Evans.	Mark, viii. 404.	
VII. 361	Hannah Gregory.	Mary, viii. 177.	
VII. 377	Mary Ann Alabaster.	Hope, viii. 156.	
VIII. 52	John Jackson.	Matthew, vii. 335.	
VIII. 55	Sarah Abbott.	Faith, x. 151.	Case not included in tables.
VIII. 156	James Edwards.	Matthew.	No notes extant.
VIII. 171	Alfred Smith.	Luke, x. 378.	
VIII. 199	Hermann Allerding.	—	Died in surgery.
VIII. 221	Henry Jeffreys.	Matthew, viii. 1.	
VIII. 282	—	—	Died in surgery.
VIII. 292	Henry Brown.	Matthew, viii. 77.	
VIII. 309	Wm. Coates.	—	Brought in dead.
VIII. 341	Amelia Roberts.	Faith	No notes extant.
IX. 101	Charles Lind.	Mark, 1881, vol. ii., 1085.	
IX. 286	James Reed.	Luke, 1882, vol. iv., 798.	
X. 90	Richard Wright.	Luke, 1882-83, 464.	
X. 104	Thomas Lowe.	John, 1883, vol. i., 312.	
X. 122	Wm. Turner.	Luke, 1882-83, 767.	
X. 125	George Howe.	Mark, 1883, vol. i., 675.	
X. 185	John Nightingale.	Luke, 1883, 1206.	
X. 355	Richard Hoskins.	Luke, July, 1883, to Nov., 1884, 244.	
X. 365	Fredk. Green.	—	Brought in dead.
XI. 47	Samuel Doune.	—	Died in surgery.
XI. 147	George Russell.	Matthew, Nov., 1883, to Dec., 1884, 1324.	
XI. 168	George Hedges.	Luke.	No notes extant.
XI. 171	Thos. Forge.	Mark, Sept., 1883, to Oct., 1884, 1625.	
XI. 191	— Thorogood.	Matthew, Nov., 1883, to Dec., 1884, 1463.	
XI. 196	George Brown.	Matthew, Nov., 1883, to Dec., 1884, 1483.	
XI. 267	Jas. Atkinson.	Luke, 1885, 169.	
XI. 289	Wm. Reading.	—	Brought in dead.
XI. 348	Thos. Johnson.	Matthew, Nov., 1883, to Dec., 1884, 1331; also 1885, 228.	
XI. 353	Alfred Reffell.	Luke, 1885, 829.	Case not included in tables.
XII. 49	Peter Murray.	John, 1885, 156.	
XII. 95	Ganaes Ganainn.	—	Brought in dead.
XII. 132	John Rowe.	Matthew, 1885, 1630.	
XII. 181	Catharine Halsham.	Faith, 1886, 174.	
XII. 295	Christina Gardner.	Hope, 1886, 28.	
XIII. 71	Louis Martens.	—	Brought in dead.
XIII. 87	Thos. Lawrence.	Mark, 1887, 2.	
XIII. 96	Wm. Gilbert.	John, 1887, 11.	
XIII. 150	James Hoste.	Mark, 1887, 44.	
XIII. 199	John Shields.	John, 1887, 87.	
XIV. 92	Edwin Andrews.	Matthew, 1887, 181.	
XIV. 109	Jane Goble.	Mary, 1887, 10.	
XIV. 304	Henry Dawson.	Luke, 1887-88, 84.	
XIV. 369	Martha Prior.	Faith, 1887-88, 99, 135.	
XV. 55	John Gough.	Matthew, 1887-88, 171.	
XV. 103	Fredk. Henchen.	Luke, 1887-88, 42, 201.	
XV. 143	Geo. Regan.	Matthew, 1887-88, 246.	
XV. 187	Wm. Hicks.	—	Died in surgery.
XV. 214	Alf. Wm. Seago.	—	Brought in dead.
XV. 219	Thos. Willson.	Mark, 1889, 27.	
XV. 270	Francis Loppenowe.	Matthew, 1889, 75.	
XV. 286	Henry Baxter.	—	Brought in dead.
XV. 306	Thos. Curtis.	Mark, 1889, 104.	
XV. 308	Stephen Rumb.	—	Brought in dead.
XV. 336	James Squires.	Luke, 1889, 112.	
XV. 350	Patrick O'Donnell.	Matthew, 1889, 133.	Case not included in tables.
XV. 375	Henry Thos. Soilleux.	—	Brought in dead.
XVI. 5	Chas. Thos. Morris.	Matthew, 1889, 152.	No notes.
XVI. 81	Christopher Holt.	Mark, 1889, 223.	
XVII. 193	John Marshall.	Mark, 1890, 151.	
XVII. 205	Wm. Warner.	Luke, 1890, 139.	
XVII. 244	James Johnson.	Mark, 1890, 222.	
XVII. 298	Geo. H. Beeden.	—	Brought in dead.
XVIII. 33	Wm. Booth.	Matthew, 1891, 26.	
XVIII. 43	Edw. John Platt.	—	Brought in dead.
XVIII. 44	Samuel Olley.	John, 1891, 25.	
XVIII. 54	Jas. W. Walters.	Luke, 1891, 34.	
XVIII. 135	Robert Gladwell.	John, 1891, 64.	
XVIII. 190	Charles Wakelen.	Mark, 1891, 154.	

TABLE A—*Continued.*

Reference to Post-mortem Registers.	Name.	Reference to Ward Note-books.	Remarks.	Reference to Post-mortem Registers.	Name.	Reference to Ward Note-books.	Remarks.
XVIII. 221	Chas. McLachlin.	Luke, 1891, 172.	No notes.	XXII. 306	John Dewberry.	Med. Register, M., 1895, vol. ii., part ii., 276.	
XIX. 71	Charles Druce.	—	Brought in dead.				
XIX. 120	Wm. Prior.	Mark, 1891, 116.		XXII. 334	Wm. Kreling.	—	Brought in dead.
XIX. 271	Lucy Ann Burt.	Elizabeth, 1892, 264.		XXII. 341	Wm. Brown.	Med. Register, M., 1895, vol. iii., part ii., 243.	
XIX. 297	Alfred Gilver.	Mark, 1892, 243.					
XX. 177	Geo. Freeland.	Matthew, 1893, vol. i. 124.		XXIII. 55	Thomas Pomeroy.	Med. Register, M., 1896, vol. v., part i., 115.	
XX. 216	Alfred H. Dimond.	Mark, 1893, vol. ii. 257.		XXIII. 66	Henry Francome.	Med. Register, M., 1896, vol. iii., part i., 37.	
XX. 282	Henry Carborne.	—	Brought in dead.				
XX. 330	Reginald Lewin.	—	Brought in dead.	XXIII. 100	Wm. Gilbey.	Med. Register, M., 1896, vol. iv., part i., 93.	
XX. 365	John Bligh.	Luke, 1893, vol. ii. 294.					
XX. 366	Wm. H. Fiddaman.	—	Died in surgery	XXIII. 101	John Collyer.	Med. Register, M., 1896, vol. ii., part i., 72.	
XX. 399	James G. Bowen.	—	Brought in dead.				
XXI. 75	Thos. Parker.	Matthew, 1894, vol. i. 63.		XXIII. 105	James Larkey.	Med. Register, M., 1896, vol. v., part i., 81.	
XXI. 131	James Mitchell.	—	Died in surgery.				
XXI. 149	Henry Lansley.	Mark, 1894, vol. i. 117.		XXIII. 116	Dennis Bryan.	Med. Register, M., 1896, vol. i., part i., 89.	
XXI. 153	Charles Grant.	Luke, 1894, vol. ii. 176.	Case published in St. B. H. Reports, 1894, p. 1.	XXIII. 164	David Jones.	Med. Register, M., 1896, vol. ii., part i., 117	
XXI. 170	Henry Squires.	John, 1894, vol. ii. 108.		XXIII. 201	Wm. H. Sutherland.	Med. Register, M., 1896, vol. v., part ii., 233.	
XXI. 288	Walter C. Pope.	—	Brought in dead.				
XXI. 293	Joseph Joyce.	Matthew, 1894, vol. ii. 233.		XXIII. 280	George Bayman.	Med. Register, M., 1896, vol. v., part ii., 176.	
XXII. 39	Cornelius Coughlin.	—	Brought in dead.	XXIII. 281	Unknown.	—	Brought in dead.
XXII. 63	Wm. Whitfield.	—	Brought in dead.	XXIII. 288	Dennis Dillon.	Med. Register, M., 1896, vol. iv., part ii., 220.	
XXII. 104	Albert Orton.	Med. Register, M., 1895, vol iii., part i., 64.	Case not included in tables.	XXIII. 312	Emma Burgess.	Med. Register, F., 1896, vol. v., 132.	
XXII. 108	John Sheehan.	Med. Register, M., 1895, vol. i., part i., 90.		XXIV. 27	Frederick Holland.	Med. Register, M., 1896, vol. iv., part ii., 208; and Med. Register, M., 1897.	
XXII. 225	Sarah Parker.	Med. Register, F., 1895, vol. i., part ii., 156.					
XXII. 257	Wm. Wellington.	Med. Register, M., 1895, vol. iv., part ii., 192.		XXIV. 120	John Newberry.	—	Died in surgery.

TABLE B.

A TABLE SHOWING THE RELATIVE FREQUENCY OF THE INCIDENCE OF ANEURYSM UPON THE AORTA AND OTHER ARTERIES OF THE BODY.

Years.	Aneurysms of Aorta.	Aneurysms of other Arteries.
1867	10	Popliteal 3; Femoral 1; Axillary 1; Innominate 1.
1868	12	External Iliac 1; Femoral 1.
1869	18	Popliteal 4; Femoral 2.
1870	13	Popliteal 7; Femoral 1; Innominate 1; Radial 1.
1871	8	Popliteal 3; Subclavian 2; Gluteal 1.
1872	13	Popliteal 3; Subclavian 3; Femoral 1.
1873	5	Popliteal 3; Subclavian 1; Femoral 1.
1874	17	Femoral 5; Popliteal 1; Temporal 1.
1875	12	Popliteal 3; Femoral 1.
1876	22	Popliteal 7; Subclavian and Axillary 3; Dorsalis pedis 1.
1877	14	Popliteal 2; External iliac 1; Femoral 1.
1878	22	Popliteal 4.
1879	15	Popliteal 5; Subclavian 1; Innominate 1.
1880	13	Popliteal 5; Subclavian 2; External iliac 1.
1881	21	Popliteal 1; Axillary 1.
1882	13	Popliteal 6; Femoral 1; Carotid 1.
1883	12	Popliteal 5; Iliac 2; Innominate 1; Carotid 1; Subclavian 1.
1884	17	Popliteal 2; Subclavian 1; Sterno-mastoid 1.
1885	19	External Iliac 3; Popliteal 2; Subclavian 1.
1886	25	Carotid 2; Innominate 1; Popliteal 1; Axillary 1.
1887	17	Carotid 1; Subclavian 1; Brachial 1; Radial 1; Plantar 1.
1888	11	Femoral 1.
1889	25	Popliteal 2; Subclavian 1; Gluteal 1; Dorsalis pedis 1.
1890	16	Popliteal 1.
1891	20	Femoral 2; Popliteal 1; Carotid 1.
1892	14	Innominate 2; Popliteal 2; Femoral 1.
1893	10	Femoral 2; Popliteal 1; Brachial 1; Ulnar 1; Radial 1.
1894	11	Popliteal 2.
1895	23	Popliteal 2.
1896	20	Popliteal 2; Carotid 2; Radial 2; Innominate 1; Femoral 1; Posterior tibial 1; Dorsalis pedis 1.

SUMMARY.

Years.	Aneurysms of Aorta.	Aneurysms of other Arteries.	
30	468	Popliteal	80
		Femoral	21
		Femoral (profunda)	1
	Of other arteries. 163	Subclavian	14
		Innominate	8
		Carotid	8
		External iliac	6
		*Radial	5
	Total 631	Axillary	3
		Subclavian and axillary	3
		*Dorsalis pedis	3
		*Gluteal	2
		Iliac	2
		*Brachial	2
		*Temporal	1
		*Sterno-mastoid	1
		*Ulnar	1
		*Posterior tibial	1
		*Plantar	1
			163

Those marked * were almost certainly traumatic.

TABLE I.

ANEURYSMS OF THE FIRST OR ASCENDING PORTION OF THE ARCH.

	Reference.*	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
1.	I. 201	M.	40	1 in. above aortic valves, arch gradually dilated into a fusiform aneurysm; hence an opening into a sacculus abutting on and almost occluding V.C.S. (A smaller sacculus anteriorly).	Pressure on vena cava superior.	Some hypertrophy, L. ventricle.	Aortic valve thickened.	Calcification in wall of sacculus; slight puckering elsewhere.	Œdema of lungs.	Dr. Church.
2.	I. 244	M.	49	Greatly dilated ascending aorta, with large sacculated aneurysm in connection with R. lateral wall, springing 2 in. above aortic valve.	Occupying anterior mediastinum and R. pleural cavity.	Slightly hypertrophied; much dilatation, L. ventricle.	Healthy.	Slight atheroma at commencement.	Increasing dyspnœa; collapse and softening of R. lung.	Dr. Church.
				A 2nd aneurysm from anterior and L. wall just below origin of innominate artery.	Causing erosion of L. side of sternum, 3rd costal cartilage and rib, and absorption of intercostal muscles.					
				A 3rd, formed by dilatation of aortic wall at commencement of descending portion.	Slightly eroding vertebræ.					
				Two or three further aneurysmal dilatations of abdominal aorta.						
3.	I. 333	M.	40	Immediately above valves aorta dilated into large aneurysm, with secondary sac bulging from it above. Great vessels natural.	Both sacs in immediate relation with sternum; heart and pericardium pushed down to left; erosion of L. side of manubrium; also cartilages 2nd and 3rd L. ribs with sternum corresponding.	Natural.	Healthy.	Natural below L. subclavian.	—	Dr. Church.
4.	II. 69	M.	48	Aorta much dilated from valves to 1 in. beyond L. subclavian. Aneurysm from R. side of middle of ascending part.	3rd and 4th R. costal cartilages with their intercostal spaces formed anterior wall of tumour; 3rd and 4th R. costal cartilages, with R. half of sternum corresponding, much absorbed. S.V.C. somewhat flattened.	No hypertrophy.	Aortic valves incompetent.	Calcareous in dilated part.	—	Dr. Gee.
5.	II. 127	M.	56	Right side of ascending portion.	Tumour in anterior mediastinum immediately above pericardium, rupturing through opening there into R. pleura.	L. ventricle enormously hypertrophied.	Aortic valves thickened and incompetent.	Ascending and transverse portions greatly dilated.	Rupture into R. pleural cavity.	Dr. Gee.
6.	II. 227	M.	34	Right side of ascending aorta midway between valves and innominate.	2nd, 3rd, 4th R. ribs entirely removed in front; pectorales spread out over tumour, and skin thin; diaphragm on R. side much depressed; rupture at lower part into R. pleura.	No hypertrophy.	Healthy.	Much dilated to 2 in. below L. subclavian.	Rupture into R. pleural cavity.	Dr. Gee.
7.	II. 260	M.	36	Right side of ascending portion.	Occupying anterior mediastinum; heart depressed; lungs pushed to R. and L.—V.C.S. and Venæ Innominatæ much compressed; some pressure on R. pulmonary artery.	Some hypertrophy of L. ventricle.	Healthy.	Slight atheroma throughout.	? Large serous effusion in both pleural cavities.	Dr. Gee.
8.	II. 303	M.	32	A slit immediately above valves led directly into aneurysmal cavity.	Opening near heart into V.C.S.	Some hypertrophy of L. ventricle.	Slightly atheromatous.	Highly atheromatous.	—	Dr. Wickham Legg.
9.	II. 341	M.	48	Whole of arch greatly dilated, especially ascending part, whence a pouch leads.	Pressing on junction of 2nd R. costal cartilage to rib, and eroding these parts for about 1 in.; apex of R. lung formed wall of aneurysm; rupture through it into R. pleural cavity.	No hypertrophy.	Healthy.	Atheromatous.	Rupture into R. pleural cavity.	Dr. Gee.
10.	III. 237	M.	50	Whole arch greatly dilated to 1 in. below L. subclavian. Pouch from dextro-anterior wall of ascending portion.	Occupying anterior mediastinum, lying close upon and raising sternum.	No hypertrophy.	Healthy.	Everywhere highly atheromatous.	? Chronic pneumonia, both lungs.	Dr. Gee.
11.	III. 313	M.	57	Whole arch greatly dilated to 1 in. below L. subclavian; just above one semilunar valve on R. anterior aspect of aorta is a ragged opening into pericardium. Large vessels not implicated.	Trachea much compressed by small pouch from aneurysm; one cartilage eroded; L. vena innominata crosses aneurysm.	Wall of L. ventricle thickened.	Healthy.	Descending aorta full of bony plates.	Rupture into pericardium.	Dr. Gee.

* The references are to volumes of the post-mortem registers of St. Bartholomew's Hospital.

TABLE I.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
12. IV. 114	M.	37	Sacculus behind posterior semilunar valve.	—	Great general hypertrophy.	Aortic valves incompetent.	Slightly dilated.	—	Dr. Norman Moore.
13. IV. 377	M.	45	Immediately above aortic valves is opening into aneurysm.	Narrowing of conus arteriosus, and interference with natural shape of pulmonary valves.	Natural.	Left valves slightly atheromatous.	Atheromatous.	Asthenia, syncope.	Dr. Wickham Legg.
14. IV. 409	M.	28	On R. side of aorta, 1 in. from ventricle, two large holes lead into aneurysm. Beyond these openings is another small aneurysm.	Pressing on apex of R. lung; pulsation felt at R. border of manubrium.	Natural.	Healthy.	Highly atheromatous.	Double empyema; R. pyopneumothorax.	Dr. Wickham Legg.
15. V. 97	F.	53	R. side of aorta immediately above valves	—	L. ventricle hypertrophied.	Aortic valve thickened; mitral atheromatous.	Fairly healthy.	—	Dr. Wickham Legg.
16. V. 173	F.	40	Immediately above valves.	Bulging from R. side of this presses much on S.V.C.; a bulging from L. side presses on pulmonary artery.	Much hypertrophy, L. ventricle.	Aortic and mitral highly atheromatous, incompetent.	Atheromatous throughout.	Extreme dyspnœa.	Dr. Wickham Legg.
17. V. 275	M.	42	Ascending part of arch 1 in. above valves.	Extending forwards and to R., pressing on L. side of pulmonary artery, also upon I.V.C. and S.V.C.	Slight hypertrophy, L. ventricle.	Healthy.	Slight atheroma.	—	Dr. Norman Moore.
18. V. 337	M.	54	Aorta immediately above valves dilated into sac, which led by wide opening into a larger sac.	Adherent to 1st bone of sternum, inner surface of which is roughened.	No hypertrophy.	Healthy.	Atheromatous beyond L. subclavian.	Heart failure.	Dr. Wickham Legg.
19. V. 345	M.	37	Aorta dilated immediately above valves. Hence lead two sacs; one to right; one from back part of aorta, also bulging to right.	This pressed on S.V.C. and ruptured into pericardium.	L. ventricle scarcely hypertrophied.	Healthy.	Some atheroma.	Rupture into pericardium.	Dr. Wickham Legg.
20. V. 365	M.	39	On opening aorta, an opening to the left leads into small aneurysm.	Pressing on and flattening pulmonary artery, as also its R. branch.	No hypertrophy.	Healthy.	Healthy.	Pericarditis.	Dr. Wickham Legg.
21. VI. 133	F	38	Sinuses of Valsalva dilated into aneurysms; one over R. valve, one over fore-valve.	—	No hypertrophy.	Healthy.	Atheromatous near aneurysm.	Uncertain. Death sudden. Heart not fatty.	Dr. Wickham Legg.
22. VII. 21	F.	50	R. side of aorta, 1 in. above valves.	Bulging on R. side of chest, close to upper part of sternum, in 1st and 2nd R. interspaces.	No hypertrophy.	Healthy.	Highly atheromatous to cœliac axis.	Bronchitis.	Dr. Wickham Legg.
23. VII. 87	M.	44	Aorta greatly dilated from immediately above valves to origin of innominate; hence a small aneurysmal sac.	Tumour projected at upper border of R. axilla.	Great hypertrophy of L. ventricle.	Aortic valves incompetent.	Highly atheromatous to L. subclavian; slightly so beyond.	Infarction in both lower pulmonary lobes.	Dr. Norman Moore.
24. VII. 189	M.	45	Large aneurysmal sac above coronary arteries and below innominate artery.	Enormous tumour in mid-chest and on R. side. R. lung firmly adherent and forming wall of cavity. 2nd, 3rd, and 4th R. ribs much eroded, with much of upper part of sternum.	"Of little more than normal size."	Healthy.	Highly atheromatous.	? Large double pleural effusion.	Dr. Norman Moore.
25. VII. 259	M.	27	Small aneurysm between orifices of coronary arteries.	Pointing towards pulmonary artery and pressing upon it just above valves.	L. walls hypertrophied, weight 3 lbs.	Aortic valves thickened, incompetent.	Arch highly atheromatous.	? Œdema of lungs.	Dr. Ormerod.
26. VII. 293	M.	54	Large aneurysm of *anterior* part of ascending portion, with fusiform extension up innominate artery. A small additional sac beyond L. subclavian.	Tumour adherent to chest wall from 3rd L. rib upwards. L. lung retracted and adherent to back of tumour. Caliber of main pulmonary artery and of its L. branch narrowed. L. vagus nerve also compressed.	Hypertrophy, L. ventricle.	Aortic valves thickened.	Highly atheromatous.	—	Dr. Norman Moore.
27. VIII. 52	M.	44	Aneurysm commencing ½ in. above valves.	Extending backwards and outwards along upper edge of R. auricle. Had penetrated muscular tissue at upper part of anterior wall of R. auricle.	Not noted.	Healthy.	Highly atheromatous.	Heart failure.	Dr. Norman Moore.
28. VIII. 341	F.	15	Between attachment of pericardium and origin of innominate artery; great vessels natural.	Tumour covered ascending aorta.	Wall of L. ventricle thickened.	Mitral stenosis. Aortic cusps adherent.	Healthy.	—	Dr. Ormerod.

TABLE I.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
29. X. 104	M.	40	Aorta dilated into aneurysmal sac just above valves.	Bulk of sac lay behind and to left of vessel. Communication with pulmonary artery. No external tumour.	Heart very flabby, weight 14 oz.	No note.	Not elsewhere atheromatous.	Rupture into pulmonary artery.	Dr. Tooth.
30. XI. 47	M.	63	Small bulging immediately above valves. Fusiform aneurysm 2 in. above bifurcation of aorta.	—	Weight 18 oz.	Healthy.	Atheromatous.	—	Dr. Norman Moore.
31. XI. 191	M.	—	Upper part of ascending aorta.	Outwards and forwards into upper lobe of R. lung, coming near surface just above R. mamma; V.C.S. compressed; innominate artery free.	No hypertrophy.	Healthy.	Atheromatous.	—	Dr. Ormerod.
32. XI. 289	M.	44	Immediately above aortic valves.	Opening into pericardium.	Not noted.	Not noted.	Atheromatous.	Rupture into pericardium.	Dr. Norman Moore.
33. XII. 49	M.	31	1½ in. above valves.	Forwards, penetrating sternum; manubrium eroded; external tumour over sternum at level of 2nd rib.	Slight hypertrophy, both ventricles.	Healthy.	Much atheroma for 1½ in. above valves, not elsewhere.	Urgent dyspnœa.	Dr. Norman Moore.
34. XII. 95	M.	—	Immediately above middle cusp of aortic valves.	Wholly within pericardium; orifice of one coronary artery opened into aneurysm.	Not noted.	Aortic valves incompetent.	Not atheromatous beyond arch.	—	Dr. Norman Moore.
35. XII. 181	F.	46	Immediately above aortic valves.	Wholly within pericardium.	Some general hypertrophy, especially of L. ventricle.	Aortic valves thickened.	Highly atheromatous.	—	Dr. Norman Moore.
36. XII. 205	F.	35	Immediately above aortic valves, not involving sinuses of Valsalva.	Backwards and to R.; R. bronchus slightly flattened; no external tumour.	General hypertrophy and dilatation.	Healthy.	Atheromatous.	?R. pleural effusion; thrombosis R. brachial and both femoral veins.	Dr. Ormerod.
37. XIII. 150	M.	—	Immediately above valves aorta much dilated; at level of 2nd dorsal vertebra opening into aneurysmal sac.	Visible pulsation in 2nd R. interspace; tumour adherent to spinal column; dorsal vertebræ, 2, 3, deeply eroded.	No hypertrophy.	Healthy.	Atheromatous.	—	Dr. Ormerod.
38. XIV. 109	F.	42	Aneurysm of ascending arch.	Bulk of tumour lay to R. of sternum, between clavicle and 2nd R. costal cartilage; heart pushed downwards and to L.; rupture externally in *left*-side sternal line just above upper border of 2nd rib; opening here communicates with opening into aneurysmal sac, just above 2nd *right* costal cartilage.	Not noted.	Healthy.	Calcareous, much dilated.	Rupture externally.	Dr. Tooth.
39. XV. 187	M.	44	Opening into aneurysmal sac on concave side of ascending and commencement of transverse arch. On anterior aspect of descending thoracic aorta a 2nd small aneurysmal bulging.	Rupture within pericardium.	No hypertrophy.	Healthy.	Highly atheromatous throughout.	Rupture into pericardium.	Dr. Ormerod.
40. XV. 214	M.	28	Small aneurysmal sac just above L. coronary artery, which was not occluded.	Passed behind pulmonary artery, and occupied groove between L. auricle and ventricle posteriorly.	Normal.	Healthy.	Some atheroma just above valves; rest free.	?Œdema of lungs.	Dr. Ormerod.
41. XV. 286	M.	40	Anterior wall of aorta 1½ in. above aortic valves.	Pinhole rupture within pericardium.	Fatty.	—	Highly atheromatous.	Rupture within pericardium.	Dr. Ormerod.
42. XV. 308	M.	26	From upper and convex part of arch immediately above valves	First slightly upwards and to R., then downwards between aorta and pericardium; rupture into pericardium.	Slight dilatation, both ventricles.	Aortic valves thickened.	Slight atheroma.	Rupture into pericardium.	Dr. Ormerod.
43. XVII. 205	M.	39	R. side of ascending aorta immediately above valves.	Forwards, penetrating thoracic wall on R. side, forming large tumour external to chest wall; here rupture; external tumour to R. of sternum, between levels of 2nd rib and junction of ensiform cartilage to sternum.	No hypertrophy.	Healthy.	Slight atheroma.	External rupture.	Dr. Ormerod.
44. XVII. 298	M.	59	Aneurysmal dilatation of aorta just above valves, partly within, partly without pericardium.	Rupture within pericardium, just in front of S.V.C.	Normal.	Healthy.	Very atheromatous.	Rupture within pericardium.	Dr. Ormerod.

TABLE I.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
45. XVIII. 44	M.	37	Large sacculated aneurysm of ascending part of arch from ¾ in. above valves to innominate artery.	Sac spread chiefly forwards, to the L., and downwards; tumour occupied upper and front part of L. side of chest; heart pushed down; sternum eroded opposite L. ribs, 1 to 3; rupture into L. pleural cavity.	Normal.	Normal.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Ormerod.
46. XIX. 297	M.	—	Just above aortic valves.	A secondary pouch pressed upon pulmonary artery just above valves.	Dilated, flabby.	Incompetent.	Atheromatous.	Increasing dyspnœa.	Dr. Ormerod.
47. XX. 330	M.	53	Large aneurysm arose from anterior wall of ascending arch.	Sac adherent to R. lung and to 1st and 2nd R. costal cartilages close to sternum; no erosion.	Hypertrophy of L. ventricle.	Aortic valves thickened.	Atheromatous.	Rupture into R. pleural cavity.	Dr. Tooth.
48. XX. 365	M.	50	Small saccular aneurysm about 2 in. above valves.	No external tumour.	Much hypertrophy.	Healthy.	Highly atheromatous throughout.	Œdema of lungs.	Dr. Tooth.
49. XX. 399	M.	55	Saccular aneurysm of arch 1 in. above valves.	Lay partly within pericardium. Adherent to R. lung; ruptured into it.	No hypertrophy.	Healthy.	General atheroma.	Rupture into R. lung.	Dr. Tooth.
50. XXI. 75	M.	48	Aneurysm of ascending part of arch.	Communicated by two small openings with pulmonary artery. No external tumour.	L. ventricle hypertrophied.	Aortic valve thickened.	Atheromatous.	—	Dr. Tooth.
51. XXI. 153	M.	53	From valves to origin of innominate artery.	Extended upwards in middle line to 1st rib, and obliquely from 2nd R. costo-chondral articulation to 5th L. ditto. Slight external projection at junction of 4th L. costal cartilage and rib. Some erosion of 3rd and 4th ribs. L. lung everywhere adherent. *Heart displaced to R.*	No hypertrophy.	Healthy.	Slightly atheromatous.	Asthenia, bronchitis.	Dr. Tooth.
52. XXI. 293	M.	29	Aneurysmal dilatation of ascending arch.	Principally to R. No visible tumour.	Hypertrophy and dilatation of L. ventricle.	Aortic valve incompetent; cusps much diseased.	Atheroma of ascending arch.	Heart failure.	Dr. Tooth.
53. XXII. 39	M.	42	General dilatation of ascending arch; several small saccular diverticula from it.	A group of such diverticula on R. side close to S.V.C; rupture into pericardium through one of these.	No hypertrophy.	Healthy.	Atheromatous.	Rupture into pericardium.	Dr. Tooth.
54. XXII. 306	M.	44	Aneurysmal dilatation of ascending part.	Towards right. Pressure on S.V.C.; much anasarca of upper part of body. No visible tumour.	No hypertrophy.	Healthy.	—	Large pleural effusion on both sides. Death sudden.	Dr. Tooth.
55. XXII. 341	M.	48	Aneurysm of ascending arch; sac extending to origin of great vessels.	Rupture into pericardium 1 in. above valves. No visible tumour.	No hypertrophy.	—	Very slight atheroma.	Rupture into pericardium.	Dr. Tooth.
56. XXIII. 66	M.	55	At summit of ascending arch. A second (smaller) aneurysm from upper part of descending portion. See Table IV., Case 18.	Forwards. Adherent to under surface of manubrium. No visible tumour, but dulness over manubrium.	No hypertrophy.	Healthy.	Much atheroma.	Tracheotomy for urgent dyspnœa.	Dr. Garrod.
57. XXIII. 100	M.	50	Large aneurysm of ascending portion. Innominate artery involved. Origin of R. subclavian artery completely occluded; origin of L. carotid narrowed; L. subclavian free.	In contact with sternum at junction of 1st and 2nd bones; here erosion. Tumour visible over mid-sternum at level of 2nd rib, and more to L. than R.	Some dilatation.	Healthy.	—	Embolism of L. anterior and middle cerebral arteries.	Dr. Garrod.
58. XXIII. 105	M.	59	Ascending part of arch.	Directly forwards; presenting towards R. of sternum. Left half of sternum at level of 2nd and 3rd costal cartilage excavated by pressure. Tumour visible over 2nd R. costal cartilage and adjacent sternum.	No hypertrophy.	Healthy.	Atheromatous throughout.	Chronic tubercular peritonitis.	Dr. Garrod.

TABLE II.

ANEURYSMS OF THE SECOND OR TRANSVERSE PART OF THE ARCH.

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
1. I. 11	M.	31	Anterior part of arch, slightly to R., 2½ in. from aortic valves. Another aneurysmal dilatation just below origin of L. subclavian.	L. lung pushed back; heart pushed down and to left; 2nd and 3rd L. ribs slightly eroded, with portion of sternum corresponding thereto.	L. side of heart hypertrophied.	Slightly thickened, competent.	Arch widely dilated, atheromatous.	—	Dr. Church.
2. I. 127	M.	35	In transverse part of arch behind and to inner side of L. subclavian and carotid (their orifices not involved).	Rupture into L. pleura, exact site not noted.	No hypertrophy.	Healthy.	Whole of ascending aorta dilated; very atheromatous about aneurysm.	Rupture into L. pleura.	Dr. Church.
3. I. 217	M.	37	Aneurysmal sacculus immediately beneath origin of L. subclavian, close to root of L. lung.	Opening through lower and anterior border of L. upper lobe into L. pleura.	Natural.	Healthy.	No note.	Rupture into L. pleura.	Dr. Church.
4. I. 242	M.	41	Posterior part of arch where aorta in closest relation with trachea. A 2nd aneurysm from anterior wall, just below origin of innominate artery. A 3rd a little below and to left of the larger aneurysm.	Pressure of larger sac caused absorption of tracheal cartilages and ulceration of mucous membrane about 2 in. above its bifurcation.	Natural.	No note.	Not markedly atheromatous.	Asphyxia.	Dr. Church.
5. I. 257	M.	42	Wall of aorta had given way 1 in. below innominate artery; pouch formed by connective tissue of mediastinum, pleura and R. lung.	Tumour occupying mediastinum; R. lung much collapsed; rupture into pericardium just below its reflection on to aorta.	No hypertrophy.	Healthy.	Ascending aorta much dilated and atheromatous.	Rupture into pericardium.	Dr. Church.
6. I. 286	M.	44	Aorta immediately above valves dilated into large globular sacculus with atheromatous walls; 3 in. above valves oval opening leads into pouch, of which walls formed by connective tissue surrounding this part of arch.	Anterior wall of tumour adherent to depression in sternum at junction of 3rd L. costal cartilage; some compression of V.C.S.; parts of wall firmly adherent to pericardium; R. lung collapsed.	L. ventricle hypertrophied.	Healthy.	Atheromatous.	? Œdema of lungs.	Dr. Church.
7. II. 173	F.	60	Rupture through inner and middle coats at origin of innominate artery; external coat quite separated from middle coat, blood-clot intervening.	Rupture into pericardium at R. side of aorta, just where arising from heart.	L. ventricle somewhat hypertrophied.	No note.	Atheromatous.	Rupture into pericardium.	Dr. Gee.
8. II. 308	M.	—	Aneurysm opens into arch 2½ in. from sigmoid valves, involving whole of innominate and part of transverse portion of arch. R. subclavian } spring from R. carotid } sac. L. carotid opens into aneurysm; L. subclavian natural.	Left vena innominata much stretched over aneurysm; rupture by small opening into trachea.	No hypertrophy.	Healthy.	Highly atheromatous.	Rupture into trachea.	Dr. Gee.
9. III. 48	M.	39	Sacculus formed by great distension of posterior wall of innominate artery at its origin.	Great pressure on anterior wall of trachea; no erosion; L. recurrent nerve much flattened.	L. ventricle much hypertrophied.	Aortic valves thickened, incompetent.	Highly atheromatous.	Tracheotomy performed for dyspnœa.	Dr. Gee.
10. IV. 194	M.	49	Sacculated dilatation in middle part of arch involving innominate artery (R. carotid and subclavian spring direct from arch).	Pressure on anterior wall of trachea; cartilaginous rings laid bare; L. recurrent laryngeal nerve runs over wall of aneurysm.	No hypertrophy.	Aortic valve incompetent.	Arch dilated, atheromatous.	Asphyxia.	Dr. Wickham Legg.
11. IV. 336	M.	36	Middle portion of arch converted into aneurysmal sacculus; innominate artery had disappeared; R. carotid and subclavian spring directly from sacculus.	Tumour rises high in neck; presses behind on trachea, which in three spots is ready to burst; L. innominate vein obliterated where it crosses sac.	L. ventricle much hypertrophied.	Fine granulations on aortic valve.	Arch dilated and highly atheromatous.	Increasing tracheal compression.	Dr. Wickham Legg.
12. IV. 364	M.	48	Middle part of arch; innominate artery involved.	Perforation of 1st bone of sternum; rupture into L. bronchus.	No hypertrophy.	No note.	Atheromatous below.	Rupture into L. bronchus.	Dr. Wickham Legg.
13. IV. 375	M.	31	Small aneurysm projected into pericardium at root of vessels; transverse portion dilated into large aneurysmal sacculus; innominate artery twisted; L. carotid and subclavian natural.	Aneurysm ready to burst in two places into trachea.	No hypertrophy.	Healthy.	No note.	—	Dr. Wickham Legg.

TABLE II.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
14. V. 137	F.	36	Aneurysm of transverse and descending portions; a small sacculus projects from its inner side.	Sac and main aneurysm both pressed on L. bronchus and on trachea just above bifurcation; wall of trachea eroded; no external tumour.	Natural.	Healthy.	No note.	Asphyxia.	Dr. Norman Moore.
15. VI. 24	F.	53	Aorta natural to L. carotid; there opening into trifid sac.	One sac eroded bodies of 3rd and 4th dorsal vertebræ; another opened into bronchial tube 1½ in. below bifurcation of trachea; the 3rd passed into main stem of pulmonary artery.	L. ventricle natural.	Healthy.	Lower part atheromatous.	—	Dr. Wickham Legg.
16. VII. 361	F.	42	At end of arch, aneurysm projecting backwards, pressing on trachea.	Tracheal rings eroded just above bifurcation. No external tumour.	Heart somewhat hypertrophied.	Fine granulations on aortic valves.	Arch dilated and highly atheromatous.	Tracheotomy performed for urgent dyspnœa.	Dr. Wickham Legg.
17. VII. 377	F.	40	Posterior wall bulged into aneurysm from origin of innominate to beyond L. subclavian.	Tumour projected in 1st R. intercostal space; 1 in. of 2nd R. rib and muscles of 1st R. intercostal space eroded. R. lung pressed down by aneurysm and adherent to it.	No hypertrophy.	No note.	Atheromatous below.	Asphyxia.	Dr. Wickham Legg.
18. VIII. 221	M.	30	Aneurysm projected from posterior part of transverse portion.	—	Natural.	Healthy.	Atheromatous.	Increasing dyspnœa.	Dr. Norman Moore.
19. IX. 286	M.	41	Aneurysm extended from origin of innominate to L. subclavian artery.	Projecting mainly forwards through 1st L. intercostal space and sternum, and barely covered by thin layer of sternum and of pectoral muscle. Contraction of L. lung.	Slight general hypertrophy.	Healthy.	Atheromatous throughout.	—	Dr. Norman Moore.
20. X. 90	M.	54	Aneurysm springing from outer aspect of transverse portion, extending to inner and posterior aspect of L. pulmonary apex. To the right was another small aneurysm.	Erosion through a large branch of L. bronchus and part of L. upper lobe. L. lower lobe full of blood. No external tumour.	Heart flabby.	Healthy.	Atheromatous.	Rupture into L. bronchus.	Dr. Norman Moore.
21. X. 125	M.	45	1st aneurysm projected from arch anteriorly and slightly to R., just below origin of innominate artery. A 2nd projected backwards from arch below, and above origin of L. subclavian artery.	Bulging inwards of anterior wall of trachea just above bifurcation. Pulsation in 2nd L. interspace. No external tumour.	Slight hypertrophy, L. ventricle.	Healthy.	Great general dilatation, with much atheroma from valves to junction of ductus arteriosus.	Sudden dyspnœa.	Dr. Norman Moore.
22. X. 355	M.	66	Whole of transverse and upper part of descending arch dilated into large aneurysmal sac.	Part of L. lung adherent to sac; L. upper lobe full of blood. No external tumour.	Weight 20 oz.	Healthy.	Highly atheromatous.	Death sudden.	Dr. Tooth.
23. XI. 147	M.	37	3 in. above valves, small hole in anterior wall leads into sac.	Lying just behind sternum and abutting on trachea.	Heart very fatty and dilated.	Healthy.	No note.	Recurring dyspnœa.	Dr. Norman Moore.
24. XI. 168	M.	50	Wide opening into large aneurysmal sac 2½ in. above valves.	Projecting *forwards* in 2nd R. intercostal space and there penetrating the muscle, and *upwards* above episternal notch, and adherent to and pressing forwards upper part of sternum; backwards and to right it compressed R. lung, which was adherent to it. Sternum eroded from 2nd R. costal cartilage to 1st L. costal cartilage, especially at R. side.	Heart slightly hypertrophied.	Healthy.	First 2 in. atheromatous.	Great œdema of aryteno-epiglottidean folds, quite closing orifice of larynx.	Dr. Norman Moore.
25. XI. 196	M.	32	Opening of aneurysm exactly in front of that of innominate artery.	Trachea eroded where it lay against aneurysm; no external tumour.	No hypertrophy.	Healthy.	Not noted.	Asphyxia.	Dr. Norman Moore.
26. XIII. 96	M.	41	Sacculated aneurysm from front of transverse part of arch.	Perforation of 2nd bone of sternum on either side, central portion intact; external tumour to L. of sternum, opposite 2nd, 3rd and 4th L. costal cartilages, also to R. of sternum, at level of 2nd costal cartilage.	Slight hypertrophy, L. ventricle.	Not noted.	Very atheromatous.	External rupture.	Dr. Norman Moore.

TABLE II.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
7. XIV. 304	M.	30	Upper part of arch converted into large aneurysmal sacculus; great vessels close to wall of sacculus, but free.	Upwards, to within 1 in. of pomum Adami; very superficial just above L. clavicle; rupture by pinhole opening into trachea; external tumour above episternal notch and sternal end of L. clavicle.	No hypertrophy.	Healthy.	Much dilated.	Rupture into trachea.	Dr. Ormerod.
8. XV. 55	M.	40	Upper part of arch; innominate artery much dilated; R. carotid and subclavian arteries occluded.	Pressure on trachea; small hole opening into it; communication with cavity of aneurysm doubtful; no external tumour.	No hypertrophy.	Healthy.	Whole aorta atheromatous.	Asphyxia.	Dr. Ormerod.
9. XV. 219	M.	29	Transverse part of arch; innominate artery free, and carotid and subclavian arteries involved in walls of sac; orifices of both narrowed.	Backwards to L. side of trachea; adherent to spinal column; 2nd dorsal vertebra slightly eroded; rupture into œsophagus; no external tumour.	No hypertrophy.	Healthy.	Otherwise normal.	Rupture into œsophagus.	Dr. Ormerod.
0. XVI. 5	M.	—	Opening into sac from back part of transverse arch; large vessels not involved. A second small aneurysm within pericardium.	Extending straight upwards in front of trachea.	Some general dilatation.	Healthy.	Atheromatous.	? Œdema of lungs.	Dr. Ormerod.
1. XX. 177	M.	28	Commencement of transverse part; opening from posterior wall just opposite root of innominate artery.	Backwards, and somewhat upwards and to left; compression of trachea just above L. bronchus, and of L. recurrent laryngeal nerve; dulness over 1st bone of sternum, and extending 1½ in. to R. of sternum above 2nd rib.	No hypertrophy.	Healthy.	Atheromatous.	Compression of trachea.	Dr. Ormerod.
2. XXI. 131	M.	58	Large aneurysm of transverse part, involving also large part of descending portion.	Aneurysm adherent to upper part of L. lung; bodies of dorsal vertebræ—5, 6, 7, 8—much eroded.	Weight 12 oz.	Healthy.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Tooth.
3. XXIII. 55	M.	50	Large sac from transverse part of arch; hence arose L. subclavian artery.	Sac in contact with spinal column posteriorly; bodies of dorsal vertebræ—2, 3, 4—much eroded; sac adherent to mediastinal surface of L. lung; rupture into main bronchus of L. lower lobe; slight bulging of chest wall to L. of sternum, opposite 2nd and 3rd L. ribs.	Normal.	Healthy.	—	Rupture into L. bronchus.	Dr. Garrod.
4. XXIII. 201	M.	30	Saccular aneurysm arose posteriorly, close to, but not involving, innominate artery. Another small aneurysm 2 in. above valves.	More to left than right of trachea; no external tumour.	Enormous hypertrophy and dilatation of L. ventricle.	Aortic valves incompetent.	Very atheromatous.	Recurring attacks of dyspnœa.	Dr. Garrod.
5. XXIII. 312	F.	44	From 1½ in. beyond origin of innominate to just beyond L. subclavian artery.	Had almost perforated trachea in two places; no external tumour.	Some hypertrophy of L. ventricle.	Aortic valves competent.	Atheromatous.	Asphyxia.	Dr. Calvert.

TABLE III.

ANEURYSMS OF THE ASCENDING AND TRANSVERSE PORTIONS OF THE ARCH.

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
1. V. 117	M.	42	Aorta dilated from short space above valves to beyond origin of L. carotid.	Pressure on trachea, which formed wall of tumour.	Natural.	Valves of L. side atheromatous.	Atheromatous.	Extreme dyspnœa.	Dr. Wickham Legg.
2. VI. 350	M.	—	Whole of inner part of arch from just above valves to origin of L. subclavian (large vessels not involved).	Tumour lay behind and above heart, pressing upon and flattening L. bronchus.	Natural.	Healthy.	Highly atheromatous.	—	Dr. Norman Moore.
3. VII. 273	M.	39	Aneurysm immediately above valves and extending 1 in. beyond origin of L. subclavian.	Cavity extended chiefly backwards and upwards against trachea; trachea perforated just above bifurcation.	Slight hypertrophy.	Healthy.	Highly atheromatous.	—	Dr. Norman Moore.

TABLE III.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
4. VIII. 292.	M.	46	Aneurysm included whole of arch as far as L. subclavian, extending anteriorly and posteriorly. Funnel-shaped dilatation of L. subclavian for 1½ in. from origin.	Projection of tumour between 1st and 3rd R. ribs. 2nd R. costal cartilage and part of sternum eroded; trachea much compressed just above bifurcation, two rings partially eroded; bodies of the two upper dorsal vertebræ eroded on R. side.	Both ventricles slightly hypertrophied.	Healthy.	Atheromatous.	Increasing dyspnœa.	Dr. Norman Moore.
5. X. 185	M.	42	Aneurysm of ascending part 1 in. above valves *and* of whole of transverse part; large vessels arose from sac. Two fusiform dilatations of descending part.	Aneurysm occupied whole of R. upper lobe. Upper part of sternum slightly eroded; attachment of 2nd rib loosened and rib displaced downwards. Tumour presented externally in 1st and 2nd R. interspaces.	Natural.	Healthy.	No note.	—	Dr. Tooth.
6. XI. 267	M.	48	From just above aortic valves to origin of L. subclavian.	Backwards towards apex of R. lung, which was collapsed and adherent to aneurysm; here rupture. Tumour projected from 3rd R. interspace to clavicle. 2nd rib much thinned.	Slight hypertrophy of L. ventricle.	Healthy.	Atheromatous.	Rupture into R. pleural cavity.	Dr. Norman Moore.
7. XV. 103	M.	63	Aorta from origin to end of arch much dilated; aneurysm chiefly from first part of transverse portion.	Projection forwards. Region of manubrium occupied by tumour. Manubrium and 1st and 2nd R. costal cartilages entirely eroded.	—	—	—	Death sudden.	Dr. Ormerod
8. XV. 270	M.	57	1½ in. above valves, opening into enormous aneurysm involving rest of ascending and posterior and inferior walls of transverse arch. Great vessels not involved.	Downwards and to left, lying upon œsophagus, encroaching upon and compressing L. lung; L. bronchus compressed, its rings eroded. Aneurysm on point of rupture here. No visible tumour.	No hypertrophy.	Healthy.	Healthy.	Hæmoptysis, asthenia.	Dr. Habershon.
9. XVI. 81	M.	31	Aneurysm from posterior part of ascending and transverse portions of arch. Great vessels not involved.	Aneurysm seated on front of trachea, which was not compressed. Rupture into tissues in front of trachea. L. recurrent laryngeal nerve involved. No external tumour.	L. ventricle hypertrophied.	Aortic valves thickened.	Atheromatous.	Tracheotomy performed for urgent dyspnœa.	Dr. Ormerod.
10. XVIII. 54	M.	54	From 1½ in. above valves to origin of L. subclavian.	Tumour lay behind upper part of sternum; some erosion; sac closely abutted on L. bronchus; no communication; ulceration (perforating) between L. bronchus and œsophagus; stomach full of blood.	Natural.	Healthy.	Atheromatous.	Hæmorrhage.	Dr. Ormerod.
11. XVIII. 221	M.	38	Ascending and transverse portions of arch; large vessels arose from upper part of sac.	2nd R. costal cartilage eroded.	L. ventricle hypertrophied.	Aortic valves incompetent.	Atheromatous throughout.	Septic pneumonia.	Dr. Ormerod.
12. XIX. 120	M.	60	Aneurysm commenced within pericardium, involved whole of arch, terminating just beyond origin of L. subclavian; orifices of great vessels normal.	None noted.	L. ventricle hypertrophied; R. side dilated.	Healthy.	Highly atheromatous.	? R. pleural effusion.	Dr. Ormerod.
13. XX. 282	M.	58	Ascending and transverse portions much dilated; opening into aneurysm from posterior wall at junction of these parts.	Aneurysm lay over and to inner side of apex of R. lung; adherent to 1st and 2nd R. ribs; no erosion.	Normal.	Healthy.	Atheromatous.	Rupture into R. lung.	Dr. Bowman.
14. XXI. 170	M.	51	Aneurysm of ascending and transverse portions of arch; great vessels not involved. A second fusiform aneurysm of descending arch and upper part of thoracic aorta, slightly eroding bodies of 3rd, 4th and 5th dorsal vertebræ.	Large tumour projected externally, occupying upper part of chest; 1st bone of sternum eroded on R. side, also sternal ends of first four ribs; R. lung collapsed, and adherent to posterior wall of sac.	No hypertrophy.	Healthy.	Highly atheromatous.	? Œdema of lungs.	Dr. Tooth.

TABLE III.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
5. XXII. 225	F.	49	Large aneurysm of ascending and transverse portions of arch; innominate and L. carotid arteries emerged from sac; L. subclavian free.	Perforated R. border of sternum, and 2nd and 3rd R. costal cartilages.	Weight 15 oz.; fatty.	Healthy.	Very atheromatous throughout.	Asphyxia.	Dr. Garrod.
6. XXII. 257	M.	54	Upper part of ascending and whole of transverse arch.	Aneurysm lay behind 1st bone of sternum, also slightly to R.; erosion of 2nd R. costal cartilage close to sternum; upper lobes of both lungs pushed aside.	L. ventricle slightly dilated.	No note.	Very atheromatous throughout.	Asphyxia.	Dr. Tooth.
7. XXIII. 101	M.	45	Aneurysm of ascending and first part of transverse arch; great vessels normal.	Main direction forwards; sac adherent to L. border of sternum; 2nd, 3rd and 4th L. costal cartilages eroded; rupture into L. pleura; an older rupture into L. upper lobe; pulsating tumour to L. of sternum, over 2nd, 3rd and 4th L. costal cartilages.	No hypertrophy.	Healthy.	Very atheromatous throughout.	Rupture into L. pleural cavity.	Dr. Garrod.
8. XXIII. 164	M.	60	One (fusiform) of ascending and another of commencement of transverse portion; great vessels not involved; fusiform dilatation also of descending portion.	Pulsating tumour visible from middle of 2nd R. rib to clavicle, and reaching 2 in. to R. of middle line of sternum; manubrium, with corresponding costal cartilages and ribs, absorbed; the second tumour, pointed forwards and to L. of sternum.	No hypertrophy.	Valves competent.	Very atheromatous, calcareous.	Asphyxia.	Dr. Garrod.
9. XXIII. 281	M.	—	Saccular aneurysm 1½ in. above valves, involving upper part of ascending arch and transverse portion to origin of L. carotid. Another saccular aneurysm of descending thoracic aorta. See Table V., Case 16.	Backwards and to right; a pouch of aneurysm lay against trachea, which formed posterior wall of pouch; leakage into eroded trachea.	No hypertrophy.	Aortic valves competent.	Very atheromatous throughout.	Rupture into trachea.	Dr. Calvert.

TABLE IV.

ANEURYSMS OF THE THIRD OR DESCENDING PART OF THE ARCH.

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
1. I. 307	M.	45	Small aneurysm from posterior wall just below ductus arteriosus.	Partial absorption of 4th, 5th, 6th, and 7th dorsal vertebræ, with shafts of ribs corresponding. Posterior part of L. upper lobe broken down. Rupture into L. pleura.	Natural.	Healthy.	Greatly dilated and atheromatous from origin to below aneurysm.	Rupture into L. pleural cavity.	Dr. Church.
2. IV. 133	M.	34	Just below origin of L. subclavian artery.	Pouch lying between aorta and apex of L. lung, which formed its anterior wall.	L. side of heart hypertrophied.	Healthy.	Highly atheromatous.	Phthisis. Cirrhosis hepatis.	Dr. Wickham Legg.
3. IV. 166	F.	32	Sacculated aneurysm springs ¼ in. below orifice of L. subclavian, resting on bodies of 3rd, 4th, and 5th dorsal vertebræ.	Bodies of 3rd, 4th, and 5th dorsal vertebræ considerably eroded. Large opening into œsophagus. Mass of fibrin projected into œsophagus and compressed trachea.	Natural.	Mitral stenosis.	Highly atheromatous.	Rupture into œsophagus.	Dr. Norman Moore.
4. V. 19	M.	34	Aorta commenced to be dilated into large aneurysm at origin of L. subclavian artery.	Erosion of 3rd, 4th, 5th, and 6th dorsal vertebræ. Œsophagus, L. bronchus and L. vagus nerve more or less pressed upon.	No hypertrophy.	Healthy.	Whole of thoracic aorta dilated.	Convulsive fainting attack.	Dr. Vincent Harris.
5. V. 241	F.	42	Lower part of descending portion of arch.	Erosion of bodies of vertebræ (unspecified). Gullet pushed somewhat to right; a large opening into it slightly below level of bifurcation of trachea.	Natural.	Healthy.	Transverse arch slightly dilated.	Rupture into œsophagus.	Dr. Wickham Legg.
6. VII. 277	M.	42	Just beyond origin of L. subclavian posterior surface of aorta bulged into an aneurysm. A slighter bulging on its opposite wall.	Sac. bursting downwards had dissected mucous from muscular coat of œsophagus as far as upper surface of diaphragm, where blood had flowed through a small orifice into L. pleural cavity.	L. ventricle slightly hypertrophied.	Healthy.	Highly atheromatous above valves.	Rupture into L. pleural cavity.	Dr. Norman Moore.

TABLE IV.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
7. VIII. 282	F.	43	Aneurysm extended for 2 in. from origin of L. subclavian artery.	Upper part of L. lung forms part of wall of aneurysm, which had ruptured into L. pleura.	L. ventricle hypertrophied.	Healthy.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Norman Moore.
8. VIII. 309	M.	43	At commencement of descending part just below origin of L. subclavian artery.	Extending chiefly backwards; L. lung firmly adherent to and forming part of aneurysmal wall, as also the much eroded bodies of 4th, 5th, and 6th dorsal vertebræ. Rupture through lung into L. pleura.	Heart "not greatly hypertrophied."	Healthy.	Highly atheromatous below aneurysm.	Rupture into L. pleural cavity.	Dr. Norman Moore.
9. X. 365	M.	38	Saccular aneurysm of descending portion.	Adherent to inner aspect of apex of L. lung; 4th, 5th, 6th, and 7th L. ribs eroded. Rupture at lower part, close to vertebræ, into L. pleural cavity.	Weight 13 oz.	Healthy.	Some atheroma of arch.	Rupture into L. pleural cavity.	Dr. Tooth.
10. XI. 171	M.	54	Third part of the arch.	L. lung adherent to aneurysm, which lay against 3rd and 4th dorsal vertebræ, the bodies of which, with the head of the 4th left rib, it had eroded, and thus had projected as a tumour in the back. Spinal canal was open to the thorax and the cord compressed. Dura mater entire; spinal cord itself not softened.	Not noted.	Healthy.	Highly atheromatous.	—	Dr. Norman Moore.
11. XIII. 71	M.	55	Aneurysm of third part of arch and upper part of descending thoracic aorta.	Wall of sac in part formed by tissue of L. lung. 3rd and 4th dorsal vertebræ eroded on L. side. Rupture into L. pleura.	Slight hypertrophy, L. ventricle.	Two aortic cusps adherent.	No calcification below aneurysm.	Rupture into L. pleural cavity.	Dr. Norman Moore.
12. XV. 375	M.	49	Descending part of arch, just below L. subclavian.	Bulging chiefly forwards and to left. Rupture into R. pleural cavity.	Normal.	Healthy.	Highly atheromatous.	Rupture into R. pleural cavity.	Dr. Ormerod
13. XVIII. 33	M.	38	Descending part of arch, just below L. subclavian.	Bodies of three upper dorsal vertebræ eroded on L. side; L. recurrent laryngeal nerve flattened and adherent to wall of sac. Rupture into L. bronchus.	Some dilatation, R. ventricle.	—	Arch highly atheromatous.	Rupture into L. bronchus.	Dr. Ormerod
14. XVIII. 43	M.	40	Descending part of arch, opposite L. bronchus.	Rupture into L. pleural cavity.	No hypertrophy.	Healthy.	Atheromatous.	Rupture into L. pleural cavity.	Dr. Ormerod
15. XX. 366	M.	52	Large fusiform aneurysm of half of transverse and whole of descending part of arch.	Aneurysm adherent to L. lung. Rupture into L. pleural cavity.	Some hypertrophy, L. ventricle.	Healthy.	Very atheromatous.	Rupture into L. pleural cavity.	Dr. Tooth.
16. XXI. 288	M.	40	Aneurysm of descending part of arch.	As arch passed over root of L. lung, small loculus compressed L. pulmonary artery. Lower part of aneurysm adherent to œsophagus at level of bifurcation of trachea; here rupture into œsophagus.	No marked hypertrophy, L. ventricle.	Healthy.	Slight atheroma.	Rupture into œsophagus.	Dr. Tooth.
17. XXII. 334	M.	67	Small aneurysm on R. side of lower part of descending arch.	Sac adherent to R. lung; rupture into R. lung, a little above R. bronchus.	Much hypertrophy, L. ventricle.	Aortic valve thickened.	General atheroma.	Rupture into R. lung.	Dr. Tooth.
18. XXIII. 66	M.	55	Upper part of descending arch. Another aneurysm at summit of ascending portion. See Table I., Case 56.	Extended backwards. Sac adherent to bodies of 2nd, 3rd and 4th dorsal vertebræ, which were eroded. Œsophagus compressed; trachea flattened and deflected by aneurysm.	No hypertrophy.	Healthy.	Much atheroma.	—	Dr. Garrod.
19. XXIII. 116	M.	44	Descending part of arch. Two distinct aneurysms.	The upper (Tangerine) was adherent to and had eroded bodies of 3rd, 4th and 5th dorsal vertebræ, and had compressed and finally ruptured into L. bronchus. The smaller aneurysm (marble) had eroded bodies of 6th and 7th dorsal vertebræ.	No hypertrophy.	Aortic valves thickened; incompetent.	Atheromatous.	Rupture into L. bronchus.	Dr. Garrod.

TABLE IV.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
. XXIII. 288	M.	35	Descending part of arch.	Main sac eroded L. side of bodies of 5th, 6th and 7th dorsal vertebræ. A smaller (false) aneurysm had compressed and finally ruptured into L. bronchus; this had also compressed and flattened L. pulmonary artery.	Much hypertrophy, especially of L. ventricle.	Aortic valves very incompetent.	Extreme atheroma throughout.	Rupture into L. bronchus.	Dr. Garrod.
. XXIV. 27	M.	38	Fusiform aneurysm of arch beyond origin of L. subclavian artery.	Compression (slight narrowing) of L. bronchus; œsophagus deflected to right; bodies of 4th, 5th and 6th dorsal vertebræ eroded; posterior wall of trachea, 2 in. above bifurcation, eroded by aneurysm; no rupture.	No hypertrophy.	Aortic valves competent.	Atheromatous.	—	Dr. Calvert.

TABLE V.

ANEURYSMS OF THE DESCENDING THORACIC AORTA.

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
1. II. 51	M.	52	Aorta expanded into a flattened sac, lying on front and to L. side of 8th dorsal vertebra, and on attached end of ribs. Innominate artery dilated to twice natural size. A secondary sac bulged from this into posterior mediastinum.	No proper posterior wall. Erosion of bodies of 8th, 9th, and 10th dorsal vertebræ. Incipient lordosis. Œsophagus passed over the smaller sac, and much flattened; a communication existing between œsophagus and sac. Thoracic duct and vena azygos obliterated.	Natural.	Healthy.	Descending aorta atheromatous.	Rupture into œsophagus.	Dr. Gee.
2. II. 78	M.	50	Oblong perforation through aorta for 3 in. above diaphragm, leading into large sac lying behind aorta.	Occupying chiefly L. side, and reaching from 7th rib behind nearly to crest of ilium. Diaphragm depressed. Bodies of 9th, 10th, 11th, and 12th dorsal vertebræ in degree eroded, especially the 10th. 10th, 11th, and 12th L. ribs greatly eroded. Pulsating tumour felt near spine on L. side.	No hypertrophy.	Healthy.	Ascending and transverse portions much dilated and atheromatous. Descending part also dilated, with two pouches capable of lodging half a walnut.	Asthenia.	Dr. Gee.
3. II. 247	M.	32	Aorta dilated into aneurysm opposite 10th, 11th, and 12th dorsal vertebræ. Two other aneurysms pouched out of this to the right.	Posterior wall formed by 10th, 11th, and 12th dorsal vertebræ, which were considerably eroded. The larger sac had broken into subserous connective tissue lying to R. of spinal column.	Natural.	Healthy.	Highly atheromatous.	Rupture to R. of spinal column.	Dr. Gee.
4. IV. 399	M.	—	Aneurysm at lower edge of 4th dorsal vertebra.	Projecting upwards. Lower edge of body of 4th dorsal vertebra eroded, also bodies of L. v. 5 and 6. Aneurysm had burst at lowest point, close to vertebræ into L. pleura.	Natural.	Healthy.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Norman Moore.
5. V. 296	M.	34	Orifice of aneurysm 3 in. below orifice of L. subclavian. Consisted of 4 parts. R. part projected in 2 masses with general direction forwards. L. part consisted next aorta of huge sac opening into a further cavity beyond, of which walls formed by various eroded tissues.	Swelling visible in L. back. 3rd, 4th, and 5th ribs necrosed and broken (2 in. of each having disappeared). Arch of 4th dorsal vertebra wholly eroded on L. side; arches of 3rd and 5th dorsal vertebræ in part so eroded. Cavity extended from 3rd to 10th L. rib; some compression of spinal column.	Natural.	Healthy.	Slightly atheromatous below aneurysm.	—	Dr. Norman Moore.

TABLE V.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
6. VI. 179	M.	47	At opening of diaphragm large opening led from back of aorta into a sac lying by its side, close to vertebræ, and communicating freely with eroded vertebræ.	Bodies of last dorsal and first lumbar vertebræ eroded. Rupture close to vertebræ into R. pleura.	Natural.	All valves thickened. Aortic valves competent.	Atheromatous.	Rupture into R. pleural cavity.	Dr. Wickham Legg.
7. VII. 253	M.	46	Descending aorta adherent to 5th dorsal vertebra. Small sac. also in ascending part of arch.	Front of 5th dorsal vertebra eroded. Perforation into œsophagus a little lower.	Heart somewhat hypertrophied.	Healthy.	Thoracic part dilated.	Rupture into œsophagus.	Dr. Ormerod.
8. IX. 101	M.	46	Large sacculated and fusiform aneurysm of thoracic aorta.	Lying on L. side of vertebral column; extending from 9th dorsal to 1st lumbar vertebra. Lower part of sac passed through arch of diaphragm. 10th, 11th, and 12th dorsal vertebræ eroded on L. side. A large ragged opening into L. pleural cavity. No external tumour.	No hypertrophy.	No note.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Tooth.
9. XII. 132	M.	41	From end of first 3 in. of straight part of aorta to diaphragm.	Rupture into L. pleura; 11th and 12th dorsal vertebræ eroded. No external tumour.	No hypertrophy.	Healthy.	—	Rupture into L. pleural cavity.	Dr. Norman Moore.
10. XV. 306	M.	48	Descending thoracic aorta.	Posterior wall of sac formed by vertebræ; 6th, 7th and 8th dorsal vertebræ much eroded; œsophagus compressed.	Hypertrophy and dilatation of L. side.	Aortic valves incompetent.	Arch dilated, calcareous.	? Œdema of lungs.	Dr. Ormerod.
11. XVIII. 190	M.	45	Aneurysmal dilatation of descending thoracic aorta. A second aneurysm of abdominal aorta involved cœliac axis.	Rupture into L. bronchus.	No hypertrophy.	Healthy.	Very atheromatous throughout.	Rupture into L. bronchus.	Dr. Ormerod.
12. XIX. 71	M.	38	Fusiform aneurysm about half-way down descending thoracic aorta.	Erosion of 6th and, more deeply, of 9th and 10th dorsal vertebræ. Rupture through base of L. lung into pleural cavity.	No hypertrophy.	Healthy.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Ormerod.
13. XXI. 149	M.	34	Large saccular aneurysm of descending thoracic aorta.	Large part of sac occupied R. pleural cavity; posterior wall formed by vertebræ; 7th, 8th, 9th, 10th and 11th dorsal vertebræ deeply eroded. Rupture into L. pleural cavity. No external tumour.	Slight dilatation, L. ventricle.	Healthy.	Slight atheroma.	Rupture into L. pleural cavity.	Dr. Tooth.
14. XXII. 63	M.	40	Large aneurysm of descending aorta.	Aneurysm lay saddle-fashion on each side of vertebral column, which formed posterior wall; 8th to 12th dorsal and 1st lumbar vertebræ eroded. R. lung adherent to sac. Rupture into R. pleura and lung.	No hypertrophy.	Healthy.	Little atheroma elsewhere.	Rupture into R. pleura and lung.	Dr. Tooth.
15. XXIII. 280	M.	52	One (fusiform) of thoracic aorta immediately above diaphragm. Another aneurysm of abdominal aorta. See Table VI., Case 23.	No erosion of vertebræ. Rupture into L. pleural cavity. No visible tumour.	Some hypertrophy, L. ventricle.	Aortic valves incompetent.	Highly atheromatous.	Rupture into L. pleural cavity.	Dr. Garrod.
16. XXIII. 281	M.	—	Saccular aneurysm of thoracic aorta. Another aneurysm of ascending and transverse parts of arch. See Table III., Case 19.	Bulging into lower lobe of L. lung just below level of L. bronchus. Rupture into L. lung and pleura.	No hypertrophy.	Aortic valves competent.	Atheroma throughout.	Rupture into L. pleura and lung.	Dr. Calvert.
17. XXIV. 120	M.	42	Small aneurysm of descending thoracic aorta 2 in. above diaphragm.	Aneurysm in relation with œsophagus and L. bronchus. Rupture into œsophagus.	No hypertrophy.	Aortic valves thickened.	Atheromatous.	Rupture into œsophagus.	Dr. Garrod.

TABLE VI.

ANEURYSMS OF THE ABDOMINAL AORTA.

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer.
1. II. 190	M.	39	Aneurysm between crura of diaphragm (also a saccular aneurysm immediately above origin of aorta from valves).	No external tumour. No injury to vertebræ. Rupture into retro-peritoneal connective tissues.	L. ventricle hypertrophied.	Healthy.	No note.	Rupture, retro-peritoneal.	Dr. Wickham Legg.
2. III. 262	M.	39	Aneurysm of L. side of aorta, just below cœliac axis.	Pulsating tumour felt at epigastrium. Rupture into retro-peritoneal connective tissues, and through rent in diaphragm into L. pleura.	Natural.	Healthy.	Highly atheromatous.	Rupture, retro-peritoneal, and into L. pleura.	Dr. Norman Moore.
3. IV. 90	M.	40	Aorta dilated immediately after passing through crura of diaphragm. Midway between L. renal artery and division into iliacs is an opening through walls of aorta into a space apparently formed in L. psoas muscle.	Pulsation felt in L. lumbar region. Bodies of vertebræ eroded. A rent in peritoneum covering rectus muscle communicates with this cavity.	Natural.	Healthy.	No note.	Rupture into peritoneal cavity.	Dr. Wickham Legg.
4. V. 262	M.	39	Opening from aorta into large sac immediately below diaphragm.	Pulsating tumour felt at epigastrium. Rupture into R. pleura through hole near R. pillar of diaphragm.	L. ventricle hypertrophied.	Healthy.	Natural.	Rupture into R. pleural cavity.	Dr. Wickham Legg.
5. VI. 374	M.	50	On passing through diaphragm aorta opens into a large sac. Large aneurysm also from aorta just above diaphragm.	Pulsating tumour on L. side from ribs to crest of ilium, and extending to R. of middle line. Aneurysm had eroded and laid bare the lumbar vertebræ, and passed on L. side to back, where was a cavity covered only by skin of back. Rupture into retro-peritoneal connective tissues on L. side.	Flabby.	Aortic valves atheromatous; two had grown together.	Much dilated.	Rupture, retro-peritoneal.	Dr. Wickham Legg.
6. VIII. 156	M	39	Immediately below diaphragm an almost uniform dilatation 3½ in. in length.	Pillars of diaphragm spread out on aneurysm and thinned. No erosion of vertebræ.	Natural.	Aortic valves incompetent.	Highly atheromatous.	Consolidation of R. lower pulmonary lobe; 2 large infarctions.	Dr. Norman Moore.
7. VIII. 171	M.	34	Large aneurysm of aorta just below diaphragm and above cœliac axis.	Pulsating tumour felt above and to L. of umbilicus. It had opened below by 2 passages; one leading underneath the peritoneum; the other into the peritoneal cavity.	Natural.	Healthy.	No note.	Rupture into peritoneal cavity.	Dr. Norman Moore.
8. VIII. 199	M.	40	Aneurysm commenced immediately below diaphragm, involving aorta in front for short distance only.	No external tumour. Aneurysm lay mainly to R. of spine, extending also short distance to L.; 1st, 2nd, 3rd, and part of 4th lumbar vertebræ eroded. Rupture into muscles and connective tissues on R. side.	Natural.	Healthy.	Atheroma.	Rupture, retro-peritoneal.	Dr. Ormerod.
9. X. 122	M.	39	Immediately below diaphragm, in posterior wall of aorta, an opening partly filled with laminated clot; a large diffused similar clot extended behind peritoneum into both iliac fossæ.	Tumour of irregular edge felt in splenic region; bodies of three upper lumbar vertebræ deeply eroded; diaphragm torn near vertebræ; hæmorrhage through it into L. pleura.	Natural.	Healthy.	Healthy above and below aneurysm.	Rupture into L. pleural cavity.	Dr. Norman Moore.
10. XI. 348	M.	46	Aneurysm, 6 in. long by 3 in. broad, extending both above and below diaphragm.	Projected as large tumour in L. hypochondriac and epigastric regions. Rupture into L. pleura.	No hypertrophy.	Healthy.	Some atheroma throughout.	Rupture into L. pleural cavity.	Dr. Norman Moore.
11. XIII. 87	M.	39	Sacculated aneurysm just below origin of cœliac axis.	Pulsating tumour felt beneath ribs on L. side; anterior wall of aneurysm much thinned, allowing escape of blood between layers of mesentery. Rupture. No erosion of vertebræ.	L. ventricle hypertrophied.	Healthy.	Slight atheroma.	Rupture into peritoneal cavity.	Dr. Norman Moore.
12. XIII. 199	M.	46	Large sac immediately below diaphragm.	No external tumour. Posterior wall of sac formed by erosion of lower dorsal and 2 upper lumbar vertebræ. Rupture into R. pleura.	Normal.	Healthy.	Highly atheromatous.	Rupture into R. pleural cavity.	Dr. Norman Moore.

TABLE VI.—*Continued.*

Reference.	Sex.	Age.	Part of Aorta affected.	Direction and Effects.	State of Heart.	State of Valves.	State of Aorta.	Cause of Death.	Observer
13. XIV. 92	M.	30	Just below origin of cœliac axis.	No external tumour. Considerable erosion of 2 upper lumbar vertebræ. Rupture into retro-peritoneal connective tissues.	No hypertrophy.	Healthy.	Very free from atheroma.	Rupture, retro-peritoneal.	Dr. Ormer
14. XIV. 369	F.	31	Anterior wall of aorta, just below diaphragm.	Pulsating tumour felt at epigastrium. Rupture into retro-peritoneal connective tissues.	L. ventricle hypertrophied.	—	Atheromatous.	Rupture, retro-peritoneal.	Dr. Ormer
15. XV. 143	M.	35	Posterior wall of aorta, nearly opposite cœliac axis.	Expansile pulsation felt at epigastrium. Projection outwards and to R. behind R. kidney, and downwards towards pelvis on that side. R. renal artery occluded. Retro-peritoneal rupture.	Dilated.	Aortic valves incompetent.	—	Rupture, retro-peritoneal.	Dr. Ormer
16. XV. 336	M.	32	Enormous sac opening from posterior wall of aorta, opposite cœliac axis.	Pulsating tumour in R. iliac and R. lumbar regions. Projection upwards towards diaphragm, also downwards and to right (sac 8 in. long). R. kidney just in front of anterior wall. 12th dorsal and 1st lumbar vertebræ eroded on R. side.	No hypertrophy.	Healthy.	Some atheroma.	Rupture, retro-peritoneal.	Dr. Ormer
17. XVII. 193	M.	43	Posterior wall of lower part of abdominal aorta.	Pulsating tumour below and to L. of umbilicus. Bodies of 3rd and 4th lumbar vertebræ eroded. Retro-peritoneal rupture.	Normal.	Healthy.	Atheromatous.	Rupture, retro-peritoneal.	Dr. Ormer
18. XVII. 244	M.	34	Two sacs sprang close together from upper part of abdominal aorta.	Pulsating tumour to L. of epigastrium. From one sac sprang cœliac axis. Rupture into duodenum.	Weight 13½ oz.	Aortic valves incompetent.	Atheromatous.	Rupture into duodenum.	Dr. Ormer
19. XVIII. 135	M.	35	Anterior wall of abdominal aorta, just below diaphragm.	Pulsating tumour at epigastrium. From sac sprang cœliac axis. Rupture into peritoneal cavity.	—	—	Atheromatous throughout.	Rupture into peritoneal cavity.	Dr. Ormer
20. XIX. 271	F.	32	Abdominal aorta, from just below diaphragm to just below renal arteries.	No external tumour. Superior mesenteric and cœliac axis quite occluded at origin.	Some hypertrophy.	Healthy.	Atheromatous.	—	Dr. Ormer
21. XX. 216	M.	37	Partly a fusiform dilatation of lower part of descending thoracic and commencement of abdominal aorta; partly an ill-defined aneurysmal cavity.	No external tumour. Cavity extended backwards into either side along ribs. Bodies of 9th, 10th, 11th and 12th dorsal vertebræ deeply eroded; 8th dorsal and 1st lumbar vertebræ partially eroded. Retro-peritoneal rupture.	Weight 13 oz.	Aortic valves competent.	Very atheromatous throughout.	Rupture, retro-peritoneal.	Dr. Ormer
22. XXII. 108	M.	24	Opening into aneurysm at level of cœliac axis, origin of which could not be found.	Ill-defined pulsating tumour felt at epigastrium. Rupture into retro-peritoneal connective tissues on L. side.	No hypertrophy.	Healthy.	Slight atheroma.	Rupture, retro-peritoneal.	Dr. Tooth.
23. XXIII. 280	M.	52	Large saccular aneurysm from posterior wall of abdominal aorta, immediately below diaphragm. Also fusiform aneurysm of descending thoracic aorta, immediately above diaphragm. See Table V., Case 15.	Aneurysm lay in angular curve of spine. Bodies of 12th dorsal and 1st and 2nd lumbar vertebræ eroded.	Some hypertrophy of L. ventricle.	Aortic valves incompetent.	Highly atheromatous.	—	Dr. Garrod.

THE END.

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