THE THERAPEUTICAL VALUE OF VENESECTION;

ITS INDICATIONS AND ITS LIMITS.

BY

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THE following remarks are based upon forty-nine cases in which I have ordered bleeding from the arm and have had opportunity of seeing its subsequent effect.

There is scarcely another instance of a remedy which was once so universally practised throughout the civilised world having fallen into such general disuse as venesection. It has often been said that our practice follows fashion rather than scientific indications, and it must be admitted that this reproach applies in some measure to the indiscriminate practice of blood-letting in the days of Abercrombie, Graves, and Latham, and to the equally indiscriminate abandonment of the treatment which followed. It is now generally believed that the routine employment of venesection in the treatment of inflammation was a mistake, that it does not possess the power attributed to it, and that it brings with it evils of its own. But if we regard its use in a more sceptical spirit than our forefathers and with the advantage of better physiological knowledge, we

may find a permanent place for the practice, secure from the changes of therapeutic fashion.

Bleeding from the arm is certainly more often ordered by my colleagues at Guy's Hospital as well as by myself at the present time than when we were students ; and I have reason to believe that the same is true of hospital practice in London generally. But if there be such a revival of what was once an almost forgotten remedy, I am not aware of any record of the facts, and have therefore thought it might be of interest to record the experience of an individual.

Of the cases on which this paper is founded, thirteen were bronchitis, in most cases an acute attack supervening on emphysema, in several complicated by more or less of lobular pneumonia, and in one by acute miliary tuberculosis. Four were cases of acute lobar pneumonia, seven of valvular disease of the heart, one of primary cardiac hypertrophy, two of acute pericarditis with effusion, and two of adherent pericardium.

Eleven were cases of Bright's disease, two acute and the rest chronic. Six were aneurysm of the aorta, five of the arch and one of the abdominal trunk. Two were cases of apoplexy from cerebral hæmorrhage, and one was a case of epilepsy.

The ages of the patients varied from eight, thirteen, and fifteen up to seventy.

The result was in thirty-one cases marked relief ; but only in twelve of these was there recovery, in five permanent, and in the other seven sufficient for the patient to leave the hospital. In nineteen cases the relief was temporary, but in several of these it lasted long enough for the urgent peril to be past, and for subsequent death to be fairly attributed to other causes. In eighteen there was only slight or no perceptible benefit.

In four of the above cases the bleeding was repeated on one or more occasions, and always with benefit.

The number of cases is far too small for statistical

treatment. Indeed, we are never justified in using percentages for numbers under 100. Moreover, the forms of disease were so different, and the age, the habits, and the condition of other organs than those primarily diseased varied so greatly, that no useful conclusion can be drawn from a mere enumeration of the results.

Venesection is not a remedy for the effects of any one pathological lesion. It is a *physiological* remedy, applicable to certain clinical conditions which may be the result of various causes, and is therefore comparable to purging or vomiting, not to mercury or quinine. The conditions in which blood-letting is indicated appear to be, speaking generally: 1st, *cyanosis* with dilatation of the right side of the heart; 2ndly, the pain of *aneurysm*; and 3rdly, eclampsia and other symptoms of *uræmia*.

Taking the first group of cases, classified in this way, no benefit was obtained in ten of them, while in fourteen the benefit was so striking and immediate that there can be little doubt the patient was rescued by venesection from immediate death. Very few, however, of these cases of bleeding in cyanosis were followed by ultimate recovery—only six out of the twenty-nine.

In the second group of cases, as well as in several other instances of aneurysm of which I have not notes, the relief was almost always very decided, the exceptions being chiefly where for some cause it was impossible to obtain so much as an ounce of blood.

In the third group of cases there was relief from the convulsions, or other uræmic symptoms which led to the employment of the remedy in nine cases, and in four of these recovery ensued.

I would submit to the Society the following indications of the value and limits of venesection, as justified at the present time both by physiological probability and by the test of clinical experience:

- (1) General bleeding is useless or injurious as a remedy

for the condition of *fever*; it is counter-indicated in enteric and other specific fevers; it is injurious in acute rheumatism, and useless for hyper-pyrexia.

When the pulse is rapid, full, and as the old physicians expressed it "bounding," bleeding is in most cases injurious. Its effect is to lower the blood-tension and quicken the pulse, and, other things being equal, is indicated by a slow rather than by a frequent cardiac action.

(2) Bleeding is unnecessary and probably injurious in cases of lobar *pneumonia* or acute inflammation of the pleura, pericardium or peritoneum, of the pia mater or kidneys. Its effect on the inflammatory process is little if any, and it probably may lead to relapse or prolonged convalescence. When admissible in these cases, it is not as an antiphlogistic, but to relieve some complication such as pain or dyspnoea.

(3) Venesection is of very doubtful benefit in cases of *hæmorrhage*. By diminishing blood-pressure and the force of the cardiac beats it would theoretically favour cessation of bleeding and the formation of a clot. But this is just what the effect of the hæmorrhage itself would be. A very large hæmorrhage, as from a ruptured aneurysm or an artery opened by a gastric ulcer, probably proves fatal by syncope or by suffocating the patient, before there is time for treatment. Smaller hæmorrhages usually cease of themselves. Moreover the popular estimation of the danger of losing blood is much exaggerated. It is extremely rare for epistaxis, hæmoptysis, hæmatemesis, hæmaturia, or intestinal hæmorrhage to prove immediately fatal and in many cases, for instance, of phthisis we find the symptoms relieved after moderate hæmoptysis.

In the most formidable cases of hæmorrhage, those due, not to a local lesion but to such conditions as purpura, leuchæmia, and idiopathic anæmia of Addison, there is no reason to suppose that bleeding would do anything but add to the patient's danger.

(4) There is, however, one kind of hæmorrhage which is dangerous, not from the loss of blood, but from the local

mischievous it produces—hæmorrhage within the cranium. In cases of *apoplexy* venesection was for many years regarded as the only effectual treatment, and remarkable instances are recorded of its good effects. Probably many of these were not due to cerebral hæmorrhage, but were epileptiform or uræmic. This criticism, however, can only apply to a certain proportion of the cases related, for instance, by so competent a pathologist as Abercrombie. The chief practical objection to the treatment is that the remedy must almost always come too late. Probably, however, venesection may often be useful in the condition of insensibility with cyanosis and stertorous breathing which frequently follows an attack of apoplexy—not by checking the cerebral effusion, but by relieving the distended right side of the heart which results from the embarrassed breathing.

(5) Bleeding in the most severe forms of *epilepsy* where convulsions are long continued or the patient passes into the status epilepticus with impeded respiration, and blueness of the surface is a plan of treatment which many years ago I saw practised with great success by Dr. Wilks. It has every probability to recommend it and is supported by experience.

(6) A similar condition in which bleeding is of undoubted benefit is that of eclampsia from *uræmia*, including puerperal convulsions and those of advanced Bright's disease. In these cases the left ventricle is hypertrophied, the resistance in the systemic capillaries is increased, and the pulse both to the finger and by a sphygmographic tracing shows high tension, with diminished systolic expansion and diminished diastolic relaxation. Under these conditions there is frequently severe headache and vomiting, with epistaxis, retinal hæmorrhage and liability to hæmorrhage in the brain. The headache is wonderfully benefited by a few leeches on the temples, but for the convulsions and more serious uræmic symptoms no remedy seems to be so efficacious as bleeding. Purging, diaphoretics, the cautious use of hot air baths and the

subcutaneous injection of pilocarpin may all be employed with advantage, but they all act better in severe cases after venesection has been performed.

(7) The pain, which is one of the most constant symptoms of thoracic *aneurysm*, is more often relieved by moderate venesection than by any other treatment. This was admitted by the late Dr. Hughes Bennett in the midst of his opposition to bleeding for pneumonia.* I shall never forget the case of a man who, for more than a week, had not been able to lie down, or enjoy more than broken and uninterrupted sleep. I found him the day after his admission to the hospital sitting up in bed, exhausted by want of rest and continually dropping asleep, but wakened again by the terrible pain he endured. The house physician had given him morphia in full doses without any benefit. He was bled from the arm to 6 oz., and before the blood ceased flowing expressed the relief he felt, and had fallen fast asleep on his pillow before the arm was bound up. His distress was never suffered to reach so advanced a point, and again and again on its return he was relieved by a similar or a still smaller abstraction of blood.

Bleeding from the arm is, in these cases, far more efficacious than the application of leeches, as well as more rapid in its effect. The object of the small venesections thus indicated is quite different from the full and repeated bleeding of Valsalva's method of treatment. The object is not to cure the disease, but to relieve its most distressing symptom. It must, we suppose, act by lowering the blood pressure in the aneurysmal sac. From experience of the manometer upon animals one would have supposed that the effects of a moderate abstraction of blood would be too transitory to be of practical service. But experience shows that this is not the case.

(8) The most frequent indication for blood-letting is general venous congestion with arterial anæmia indicated by *cyanosis* with dyspnoea, turgid veins, swollen liver,

* 'Principles and Practice of Medicine,' 3rd ed., 1859, p. 296.

albuminuria, pulsation in the jugular veins, and at the epigastrium, functional incompetence of the tricuspid valve (sometimes indicated by a systolic murmur), and a weak, small, and fluttering radial pulse. Under these conditions a moderate abstraction of blood relieves the distended right side of the heart and gives it a chance of recovering its propulsive power over the blood which reaches its cavities. The effects are no doubt transitory; but so, we may hope, is the condition we are seeking to remedy. The tendency to death is imminent and unmistakable; by obviating it we may often save the patient for the time being and give him a chance of recovery. However produced, the well-marked clinical condition just described appears to call for blood-letting as the most rapid and efficient remedy.

Where there is already anasarca, much less benefit is, I think, to be obtained than at an earlier stage. Again in valvular disease of the heart the effects are less striking and permanent than when the obstruction to the circulation is in the pulmonary capillaries; and the effect is better in cases of chronic bronchitis and emphysema than in those of lobar pneumonia, or of miliary tuberculosis. In that very grave combination of pericarditis with pleurisy and pneumonia, venesection may afford relief; but where there is extensive pleuritic effusion paracentesis is probably a more effectual and safer remedy; and where the pericarditis has gone on to the distension of the sac tapping the pericardium is the only effectual treatment. In cases of adherent pericardium, with or without valvular lesions, venesection has its place, and was remarkably beneficial in the case of a child recently under my care who suffered greatly from this very unfavourable condition; but the result can only be temporary.

The amount of blood to be withdrawn will differ with the object. To relieve the pain of aneurysm a very few ounces suffice,—3 to 6 is often enough, but it may be repeated whenever the pain returns. In cases of uræmic

convulsions bleeding should be more free and is often usefully supplemented by leeches. In a condition of cyanosis still larger depletion may sometimes be needful—from 10 or 12 to 15 ounces. In all cases the bleeding is most useful as an introduction to subsequent treatment. Purging is of course indicated in uræmia, aided by pilocarpin and other diaphoretics; and stimulation by ammonia or ether, with digitalis, senega or squills, in cases of bronchitis and of cardiac disease. In cyanosis, brandy as well as ammonia is often essential; nor is there any contradiction in first lightening the heart of its load and then stimulating it to increased exertion.

Cases of Venesection, 1875—1890.

1. John Ward, bed No. 1, April, 1875, male, æt. 60. Chronic bronchitis, cyanosis, no cardiac disease, no albuminuria, respiration 62, almost suffocated. V.s. ad 3x: much relieved, respiration sank from 62 to 50, but the patient died that night. There were pleural adhesions on both sides, emphysema, dilated and hypertrophied right side of the heart; valves competent, kidneys normal.

2. John, 5, April 12th, 1875, M., æt. 25. A stout, healthy young man, not a drunkard. Acute lobar pneumonia of left base. On the third day, very ill with dyspnœa and pain. V.s. ad 3x: no marked relief, although the pulse-tracing showed diminished tension. Next day profuse frothy expectoration, with signs of bronchitis on both sides; treated with brandy and ammonia; but he died that night. There was found grey hepatisation of the whole of the lower lobe of the left lung, and two small inflammatory patches in the right, with œdema and profuse bronchial secretion in both.

3. Mary, 15, December, 1875, F. Capillary bronchitis, with intense cyanosis, no orthopnœa. V.s. ad 3vij. This was repeated, but the patient died.

4. Mary, 5, August, 1876, F., æt. 13. Mitral imperfection. V.s. repeated. (She was a patient of Dr. Wilks, in whose absence I ordered the first v.s.; after his return he ordered the second.) Improved and went out pretty well.

5. Stephen, 50, November, 1876, M., æt. 25. Pericarditis with endocarditis of the mitral valve, considerable hæmoptysis, and pleurisy, in course of rheumatic fever: third attack of rheumatism, the first four years ago, then three months ago; present attack slight. V.s.: blistered and given digitalis, ammonia, ether, and brandy. Died. Seventeen ounces of purulent serum in pericardium with shaggy lymph. Old valvular disease.

6. Mary, 7, November, 1876, F., æt. 29. Chronic tubal nephritis after scarlet fever, dropsy, pleurisy, uræmia, vomiting, eclampsia. V.s. twice, each time with decided improvement. After death the kidneys were found large, yellow, and mottled, with irregular surface and wasted cortex. Heart 15 oz. from hypertrophy of left ventricle. Numerous spots of hæmorrhage in retina.

7. John, 16, August, 1877, M., æt. 40, soldier. Enormous aneurysm of ascending aorta distending the right breast. Death from hæmorrhage into subcutaneous tissues. V.s. ordered, but scarcely enough blood withdrawn to have any effect.

8. Stephen, 26, November, 1877, M., æt. 15. Aortic valvular disease, great pain and dyspnœa. Six leeches on chest and v.s. ad $\frac{3}{4}$ iv. He was much relieved by the leeches. Died a few days later; moderate dropsy; aortic incompetence; bovine heart.

9. Mary, 6, August, 1878, F. Aortic obstruction and regurgitation; dropsy; purpura (probably secondary); extremely ill. V.s. ad $\frac{3}{4}$ vj. Great relief. Went out much better.

10. Stephen, 31, August, 1879, M., æt. 30. Mitral disease after rheumatism. Anasarca. V.s. ad §iv; great relief. Died some weeks later from acute pleurisy.

11. Stephen, 25, November, 1875, M., æt. 45. Aneurysm of abdominal aorta. V.s. ad §iij. Went out relieved.

12. Stephen, 32, November, 1879, M. Acute bronchitis with right pleural effusion, following an attack of delirium tremens; great cyanosis. V.s. ad §viiij. The pulse afterwards was irregular, and the cyanosis was not diminished; he remained insensible, with increasing asphyxia, and died on the third day after the bleeding. Healthy kidneys; wasted brain; thickened meninges; moderate pleuritic effusion.

13. John, 5, April, 1883, M., æt. 43. Aneurysm of aorta; severe bronchitis. Ice bag on tumour. Increased dyspnoea. V.s. ad §vj; relief. Subsequently the aneurysm perforated the chest wall, and he died several weeks after the bleeding from dyspnoea with failing heart. There was no rupture of the sac, but an abscess had formed close to it, and had received pulsation from it during life. This was due to caries of the perforated sternum.

14. John, 2, June, 1883, M., æt. 60. Severe eclampsia with cyanosis. There was no evidence of renal disease. V.s. ad §xij. He recovered, and went out pretty well.

15. June, 1883, M., æt. 50. Excessive dyspnoea with pneumonia, bronchitis, and cyanosis. Attempted v.s., but only an ounce of blood could be obtained, and he died within an hour. Beside right lobar pneumonia with pleuritic effusion, there was general bronchitis with emphysema and ulcerative endocarditis. Rheumatism ten years before. Urate of soda in great toe-joint.

16. July 31st, 1883, M., æt. 35. Brought in from the

street in an apoplectic fit; insensible with stertorous breathing. V.s. ad $\mathfrak{Jiv}$. The pulse quickened, but otherwise no change. Died two hours after admission. Extensive hæmorrhage in the left lenticulus, breaking into the ventricle and filling the third, fourth, and aqueduct.

17. Stephen, 8, August, 1883, M., æt. 40. Aneurysm of ascending aorta; bronchitis. Dry cupping between the shoulders. V.s. ad $\mathfrak{Jxij}$. Fits of dyspnœa continued to occur, and one night laryngotomy was performed. Death, probably from hæmorrhage into the trachea. A large aneurysm was found pressing on the left bronchus and trachea.

18. Stephen, 2, October, 1883, M., æt. 36. Aneurysm of ascending aorta and innominate. V.s. ad $\mathfrak{Jxv}$. Great relief, and smaller bleedings than this were repeated and found more beneficial than morphia, leeches or cupping in relieving the severe pain. "He had lost 132 oz. of blood by twelve bleedings in the course of a fortnight, and again and again had been thus rescued from impending death by suffocation."

19. Phil., 26, November, 1883, M., æt. 27. Acute tubal nephritis; uræmia with scanty urine and vomiting. Hot air baths, pilocarpin, purging and cupping were all tried, without relief of the uræmic symptoms. V.s. ad $\mathfrak{Jviiij}$ was followed by some relief. Pericarditis came on with double pleural and peritoneal effusion and almost complete suppression of urine. After death, the kidneys weighed 22 oz., large and mottled.

20. March 11th, 1884, M., æt. 42. Drunkard; brought in insensible, without stertor, apparently from apoplexy. V.s. ad $\mathfrak{Jvj}$, and turpentine enema. No improvement. Cheyne-Stokes' respiration. Temperature rose. Death from dyspnœa. Extensive hæmorrhage in the right corona radiata, not touching the surface or ventricles.

21. Miriam, 28, March, 1884, F., æt. 50. Chronic osteo-arthritis with disease of left apex, severe capillary bronchitis with ascites and impending suffocation. V.s. ad 3xx. Relieved and apparently rescued from death. Died three days later. Chronic cirrhosis of one lung with adherent pericardium.

22. Philip, 37, July, 1884, M., æt. 28. Right pneumonia with pleuritic effusion. Excessive dyspnoea, impending suffocation. V.s. ad 3vj. Relief. The pleuritic effusion afterwards increased, and 55 oz. of serum were drawn off by paracentesis. Recovery.

23. Mary, 33, November, 1884, F., æt. 40. Morb. Brightii. Eclampsia. V.s. ad 3vij. Vomiting and convulsions ceased, but coma afterwards came on and she died without fresh convulsions. Granular kidneys; hypertrophied left ventricle with fibrous patches.

24. Phil., 33, August 1st, 1885, M., æt. 35. Morb. Brightii. Uræmia. V.s. ad 3xviiij. The convulsions were relieved, but he died in the same month. Large, smooth, white kidneys. Great hypertrophy of left ventricle.

25. Phil., 30, December 15th, 1885. Enormously fat man about forty years old. Severe bronchitis with dilated right heart, dropsy, and cyanosis. V.s. repeated with benefit, but died ten days after admission. Bronchitis and pulmonary oedema, with dilated right side of heart.

26. John, 1, January, 1886, M. Morb. Brightii with left pleurisy, cystitis from stricture, and uræmic symptoms. V.s. ad 3iv. Relief. Steady improvement, and went home much better.

27. John, 5, January, 1886, M., æt. 21. Acute capillary bronchitis following previous attacks, with emphy-

sema. V.s. twice, but the relief only temporary. After death there was extensive emphysema with dilatation of the right side of the heart. A well-nourished, muscular young man, a stonemason, who had had winter cough for several years; he was working up to a week before his death.

28. John, 11, January, 1886, æt. 41. Chronic morb. Brightii with uræmia, delirium and excessive dyspnœa. V.s. ad ʒviij and leeches to sternum. Pilocarpin. In great danger for about a week, but then improved greatly. He died at last, however, two months later. Granular contracted kidneys with hypertrophied left ventricle, and lithate of soda in the joints were found after death.

29. Mary, 31, March, 1886, F., æt. 40. Morb. Brightii, uræmia, pericarditis, and retinal hæmorrhage. V.s., little benefit. After death, contracted granular kidneys, hypertrophied left ventricle, pericarditis, and cedema of the lungs were found.

30. Phil., 22, June, 1886, M., æt. 38. M. cordis with albuminuria and orthopnœa. V.s. ad ʒiv. The relief was but slight, and he died after about a month. The heart weighed 21 oz., but there was no valvular lesion.

31. Phil., 36, August, 1886, M., æt. 25. M. cordis : aortic regurgitation and mitral obstruction with regurgitation. V.s. ad ʒiiij. Marked relief when almost moribund, and he went out after some months much relieved. Readmitted the following year and again relieved by bleeding and by leeches on more than one occasion. At last became delirious and died.

32. Mary, 24, August, 1886, F., æt. 16. Acute Bright's disease with dropsy, uræmia, eclampsia. V.s. ad ʒiv, pilocarpin, hot air baths. Remarkable improvement,

uræmic symptoms ceased, and she went out apparently well.

33. Phil., 24, an elderly man, October, 1886. Morb. cordis (mitral incompetence) with bronchitis, albuminuria and jaundice, delirium, great dyspnœa, and impending suffocation. Twice saved by v.s., the first time 18 and the second 12 oz. were withdrawn. At last he died, and beside cardiac disease and bronchitis, cystic kidneys were found.

34. Miriam, 27, November, 1886, F., æt. 74. Acute bronchitis with cyanosis threatening suffocation. V.s. ad ʒviiij. Decided improvement, but relapse and death some days after. Beside bronchitis she had granular kidneys with numerous minute cysts.

35. December, 1886, M., æt. 21. Left pleurisy with effusion, 8½ oz. removed by paracentesis, still dyspnœa severe, dulness at both bases with irregular pulse. Only a week ill. On the third day v.s. ad ʒiv, followed by little or no relief. After death, beside double pleuritic effusion, there was extensive lobular pneumonia and acute pericarditis.

36. Phil., 25, January, 1887, M., æt. 50. Acute bronchitis, urgent dyspnœa. V.s. ad ʒvj. No relief; died soon after admission.

37. March 3rd, 1887, M., æt. 50. M. Br. uræmia. Very stout, intemperate, and dropsical. Walked into the hospital to ask for a dose of physic; became rapidly ill, and the same afternoon was found pallid and insensible, with small hard pulse, and Cheyne-Stokes' respiration. V.s. ad ʒiv, and turpentine enema. He died the same evening, and there was found, as expected, granular and cystic kidneys, with hypertrophied left ventricle, anasarca, and some effusion in each pleura.

38. Phil., 24, August, 1887. A very stout man. Great dyspnœa, with bronchitis, albuminuria, and gout. V.s. ad 3v: relieved, and went out, after several weeks, apparently well.

39. Phil., 33, November, 1887, M., æt. 52. Admitted with bronchitis and albuminuria. Suddenly worse, with râles over both lungs, and hæmoptysis, apparently moribund. V.s. ad 3viiij, followed by subcutaneous injection of brandy, and a brisk emetic. Revived, continued very ill with hæmoptysis, gradually improved, and at last went out well.

40. Phil., 37, August, 1888, M., æt. 54. Morb. Brightii. Sudden attack of pulmonary œdema, with epistaxis and intestinal hæmorrhage. V.s. ad 3x: no marked improvement. Death two days after. Large white kidneys beginning to undergo granular contraction; œdema of lungs and larynx; no cardiac hypertrophy.

41. John, 6, November, 1888, M., æt. 18. Admitted with intense dyspnœa and cyanosis. Acute tuberculosis, diagnosed as capillary bronchitis from miliary tubercles. V.s. ad 3iv: very slight relief, and death with cyanosis. Both lungs found full of miliary tubercles; no chronic phthisis; tubercles in liver and kidneys, and in peritoneum; a few tubercular ulcers in ileum. No caseous material or primary seat of tubercle discovered.

42. Phil., 24, March, 1889, M., æt. 29. Hard drinker; subject to winter cough. Admitted with intense dyspnœa, orthopnœa, and cyanosis; diagnosed as acute capillary bronchitis with dilated right heart and tricuspid regurgitation. V.s. ad 3xij; calomel, ammonia, and brandy; six leeches to chest. Relief after the bleeding. Died thirty-six hours after admission. Emphysema, with œdema of lungs and pleuritic adhesions, lobular pneumonia, dilated right heart, and nutmeg liver; kidneys normal.

43. Phil., 38, October, 1889, M., æt. 8. Severe and advanced mitral disease and adherent pericardium, without dropsy ; great orthopnœa, pain, and distress. V.s. ad ʒiss. "This did great good, and he slept that night instead of kneeling up in distress. He took food again, was dressed, and sat up in a chair for several days. Then a fog came on, and he died after a few hours. The house physician had again tried to relieve him by opening a vein. The pericardium was found universally adherent, with incompetent aortic valves and puckered and dilated mitral."

44. December, 1889, M., æt. 24. Admitted with intense dyspnœa and cyanosis. Treated by an emetic, and v.s. ad ʒvj. Somewhat relieved, but died on the third day. Emphysematous lungs with bronchitis and lobar pneumonia ; dilated right side of heart.

45. Philip, 24, January, 1890, M., æt. 44. Beer drinker ; subject to winter cough. Acute bronchitis with lobular pneumonia ; clubbed nails ; cyanosis and delirium. (A history of hæmoptysis led me to suspect chronic phthisis.) V.s. ad ʒvj. Decided relief was obtained, but he afterwards sank. Emphysema, bronchitis, and extensive lobular pneumonia. Recent acute double pleurisy. Right side of heart not dilated. Kidneys somewhat granular, with the cortex of one decidedly wasted.

46. Philip, 36, April, 1890, M., æt. 33. No history of rheumatism ; maculæ from lues ; aortic obstruction and regurgitation ; pallor ; pain ; orthopnœa. V.s. ad ʒvj : relief. Died next day. Fungating disease of both aortic and mitral valves, with renal embolism. Cardiac organs : no atheroma. Only ill since Christmas.

47. Philip, 33, September, 1890, M., æt. 40. Bronchitis and emphysema. Dilated heart. Feeble pulse. Scanty high-coloured urine without albumen. Very ill. V.s. ad ʒvj : marked benefit. Steadily improved and went out well.

48. Philip, October, 1890, M., æt. 38. Aneurysm of transverse aorta. Great distress. Small v.s. ineffectual. Went out unrelieved.

49. Philip, 39, October, 1890, M., æt. 8. Adherent pericardium and mitral regurgitation. V.s. ad 3iv : marked relief. Death later.

Summary of Cases.

Bronchitis and cyanosis	13
Acute capillary bronchitis, with emphysema, bronchial pneumonia, or, in one case, miliary tubercle.	
Lobar pneumonia and cyanosis	4
Morbus cordis, aortic, mitral, or in one case idiopathic hypertrophy, with cyanosis	8
Pericarditis (one with pleurisy and lobular pneumonia)	2
Adherent pericardium (one with chronic cirrhosis, one with mitral regurgitation)	2
	4
Morbus Brightii (with anæmia)	11
Aneurysm of aorta	6
Apoplexy (cerebral hæmorrhage)	2
Epilepsy (or eclampsia not due to uræmia)	1
	3
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Summary of Conclusions.

A. Bleeding contra-indicated.

For pyrexia, enteric fever, rheumatism, hyperpyrexia.

For frequent and bounding pulse.

To cut short pneumonia, pleurisy, pericarditis or peritonitis,
meningitis or acute nephritis.

To relieve "cerebral congestion," apoplexy, &c.

To stop hæmorrhage.

B. Indicated.

I. To relieve the right side of heart in pulmonary obstruction, shown
by cyanosis, pallor, dyspnoea, and a small feeble pulse.

1. In chronic bronchitis and emphysema, acute capillary bron-
chitis, lobular bronchial pneumonia, acute tuberculosis.

2. In pneumonia, with much cyanosis.

3. In cardiac disease, with great dyspnoea.

4. From pericarditis, with great effusion, orthopnoea, and feeble or irregular pulse.
5. From adherent pericardium, with or without valvular lesions.
- II. To reduce arterial tension, and relieve pain due thereto.
 1. In aneurysm.
 2. In aortic valvular disease, with high tension and headache.
- III.
 1. To relieve uræmia, in acute nephritis with suppression, or in very chronic nephritis with headache and eclampsia.
 2. In epilepsy (not of uræmic origin) and apoplectiform eclampsia.

Immediate indications.—1. Excessive cyanosis, with or without dropsy, whether pulmonary or cardiac in origin, with full veins and empty arteries, pallor, dyspnoea, orthopnoea, asystolian, small, feeble, irregular, or imperceptible pulse. Perhaps repeat several times.

2. Uræmia, with hard pulse, headache, and especially with convulsions and hæmorrhage.

3. Intense pain of aneurysm, and some forms of aortic and valvular disease.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. iii, p. 48.)