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In the connection between diseases of the heart and apoplexy.

J. H. Broadhurst
To the superficial observer it may appear strange, that the connection between diseases of the heart and apoplexy, if it have any existence at all, should have remained so long unobserved. Upon a closer examination of the subject, however, this will cease to be a matter of surprise. It is true that apoplexy is a disease so well marked in its symptoms, and so dreadful in its consequences, as necessarily to arrest the attention, and excite the curiosity of the most unobservant; but with regard to diseases of the heart, the case is very different; many of these are extremely obscure in their origin, insidious in their progress, and very frequently masked in their symptoms. Besides this post mortem examination of the body, were it in former times of rare occurrence, we can it therefore astonish us, that the morbid conditions of the heart, frequently presenting as they do no very striking appearances, should even where an opportunity occurred of examining the organ after death, have been frequently overlooked.

Since the brilliant addition which Lincoln...
made to our means of diagnosis in disease of the chest. However, an immense advance has been made in our knowledge of cardiac disease, and not only may we now detect it however slight, even at its outset, but in the vast majority of cases, we may determine with wonderful accuracy the exact seat and nature of the affection, and moreover, in consequence of the frequency of post mortem examinations, how a day, we have an opportunity of verifying or correcting our diagnosis formed during the life of the patient, by a reference to the appearances found after death. It has long been matter of observation, that the functions of the brain are remarkably under the influence of the varying conditions of the circulation. The utter arrestment of the functions of the brain, by excessive loss of blood is well known, and the peculiar effect of smaller losses frequently repeated, as determined by Marsh and Hall and others are scarcely less remarkable. Many curious facts have been placed on record proving the effect. Suture on the functions of the brain, as doubt through the medium of the circulation,...
The memory in some, hallucinations when in the erect posture, becomes accurate and minute so soon as the horizontal posture is assumed. Sight and hearing have been also been known to be in the same manner similarly affected. M. Briècheau carries this step further, and considers the function of the brain to be closely dependent upon the circulation, as is ray that when the brain is removed from the crural of the circulation by means of a long neck, the intellect of the animal diminishes proportionably. He calls this mode that men of fertile genius and vivid fancy, have been generally short in the neck, and by referring to the lower animals, he fancied a further corroboration of his views may be obtained. Be this as it may however, it must be said few will be found to deny the important influence which is exerted on the brain by the state of the circulation. Can we then wonder that disease of this organ by whose agency the circulation is carried on, should be frequently followed by lesion of the brain? The precursory symptoms of an apoplectic fit
are interesting, and important, when considering the present subject especially, as indicating a disorderly state of the cerebral circulation. They consist among others of pain in the head, general headache, sense of weight and pulsation in the head, turgid appearance of the external parts of the head, lividness and edema of the face, opisthotonos, various affections of the special senses, etc., etc. When the epileptic fit is fully formed, the symptoms are still more marked, there is complete insensibility, often more or less convolution, entire loss of voluntary motion, in short to sum up we may say that the functions of animal life are entirely suspended, whilst those of organic life remain more or less unaffected. Some of these cases are sudden, and so terrible to all appearance, terminate in so long time in complete recovery, as trace remaining of the recent obliteration of the cerebral functions. Others in which the symptoms are precisely the same terminate fatally. The morbid appearances found after death are extremely various; in some there is absolutely no morbid appearance, the state of the brain...
vessels, etc., being as far as can be detected after the most minute examination perfectly normal; in these where the symptoms were during life precisely similar we find an extreme degree of turbidity of the vessels. The brain, or a clot of blood, or an effusion of serum, or what then can we suppose the apoplectic fit essentially to depend where the marked appearances are so obvious? The earlier writers from noticing that the precursory symptoms indicate an increased flow of blood towards the head, and from frequently finding turbidity of the vessels, or effusion of blood or serum after death, perhaps too soon having noticed, that the symptoms following depression of a portion of the skull, closely resemble those of apoplexy, considered compression of the brain as the cause morti. Almro SEANDER was the first to throw doubts on the correctness of this view. If the matter, his doctrine being that since the brain is contained in a bony spherical, unyielding case, which together with the blood, serum, and membranes, it completely fills, and since also it is itself life
The other solids of the body, almost incomparable in quantity, of fluid contained in it, can at no time vary, any deficiency in the blood or serum, being counterbalanced by an increase in the quantity of the other contents. These views were very generally adopted, and a series of experiments were undertaken by Sir Keith of Stutt, to test their accuracy. The conclusion drawn by Sir Keith from a numerous and varied series of experiment on various animals, chiefly however on sheep, was favourable to the theory of Horne, and he says that we cannot in fact allow to any considerable degree, the quantity of blood within the cranium, by arteriostomy or occlusion, and that when the quantity of blood is by profuse hemorrhage diminished in any sensible extent, there is commonly an increased effusion of serum throughout.

The doctrine of Horne was therefore now proved to be correct, and asphyxia under such circumstances resulted from pressure on the brain, was referred to this cause. The theory of Horne, however, was as a gain, its turn disturbed, and called in question.
by Dr. Burrows, was dissatisfied with
the conclusions of Dr. Kellie as drawn from
the experiments as in stated by himself, and
which I am sure cannot be wondered at by
any one who has read the account of these
experiments, undertaken a new series himself.
He experimented on rabbits, and in conseque-
cnce, if these experiments came to a diametrical
opposite conclusion to Dr. Kellie, one that the
brain is as liable to depletion by bloodletting
or to confection as any other part. These
new experiments, even by many who had
been in the habit of inculcating the doctrine
of Maimon, were considered subversive of the doctrine
and they now confessed to have always
held, with some doubts and misgivings
as to its accuracy. At the present day the
treatises on the blood of Maimon, supported by
Dr. Kellie’s experiments, and on the other
of Burrows supported by his own experiments
find numerous able men as their supporters.
Seeing their such difference of opinion,
apparently so on mere matter of fact,
and considering the question to bear very
closely on the subject of his dissertation.
I thought I might with advantage, repeat
some of the experiments on animals, and
at least satisfy my own mind; and that
of my friends Mr. Philbrick and Storey,
who assisted me with pencil and wit in all
my experiments, as to the real state of
the case. Selected rabbits as the animals to
be experimented upon, as being readily
obtainable, and the results of these experiments
now proceed to give.

1. To the first rabbit chloroform was first given,
as it was intended to take some of the vessels,
and it was well if possible to avoid giving
unnecessary pain. Unfortunately the animal
died from the effects of the chloroform, it was
therefore hung up by the hind legs, that the
effects of gravitation on the amount of blood
within the cranium might be observed. After
having for about 20 minutes, a tight ligature
was placed round the neck, until the
animal being dead in the horizontal posture
the skull was opened. Resinuous and veins
were found jorped with blood, amounting
certainly to not less than half a dram; the
other part of the brain were found proportionably
In this rabbit the external jugular veins were first tied, and the animal was then allowed to remain quiet for about half an hour. The eyes were observed to become remarkably brilliant and prominent. It seemed lively and ate some bread, and cleaned itself, these circumstances I mention to show that much distress cannot have resulted from the obstructed venous circulation through the brain; at the end of half an hour the carotid arteries were tied, and again the animal remained quiet for some time. The eyes now became sunken, the movements of the animal slow and listless, and there seemed to be a tendency either to coma or syncope, in fact it appeared very much as if falling to sleep; this disappeared for a while if the animal was roused, but soon returned. The carotid and jugulars were then cut across, and after death the animal was suspended by the ears. In about half an hour it was taken down and examined as the load had been. The difference in the appearance of the brain was most remarkably, and throughout the
Whole brain and membranes there were not
Three drops of blood to be seen, nor even his
remarkable deficiency made up for by an
increase in the quantity of serum, of which there
was as trace whatever.

III. This rabbit was strangled and hung up
by the hind feet, for half an hour it was
taken down and examined, on removing the a
portion of the skull the brain started up in a
remarkable manner, projecting above the
table of the skull; about a tea spoonful of blood
was found in the interior of the cranium, no
effusion apparent could be detected, though
I cannot certainly say there was none, as it
might have become mixed with the blood
such escape from the wounded sinuses
and to elude observation.

IV. In this experiment decided to have a death
stroke which would influence the state of
the circulation in the brain, as little as possible—or
rather, which would alter the amount of
blood as little as possible—the thorax was
rapidly opened and all the great vessels
leading from the heart, were compressed between
the fingers and thumb, Convulsion immediately
occurred, and the animal was soon dead, it was left on its side for about 20 minutes. The brain when examined exhibited an intermediate state of injection, but the quantity of blood approached much nearer certainly to half a dram than to 5 drops. In this rabbit the special canal was opened to see if there were any spinal fluid accumulated here; but no more was found than necessary to lubricate the surface. The amount of blood was about natural, that is, the vessels neither appeared jogged nor empty.

In this rabbit the vessels of the neck were a few cut across, and the animal was then hung up by the nose, and in 20 minutes examined. The same undue appearance was remarked, as in the other case of death from hemorrhage, and no more serum was detected, than sufficient to moisten the surface. The spinal cord was also examined, and the blood found thinner in the last mentioned experiment, and no serum. I have not entered as minutely as I might have done into the appearances.
presented by each part of the brain, from a desire not to occupy too much of your time, but I may say that the whole organ is so in every case thoroughly and minutely examined, and found to correspond in its appearance with those mentioned. Matters, therefore, I was inclined to presuppose, from the arguments of others, the experiments of Kellie, and more particularly from the able paper of Dr. Sheard on the subject, which Carus corroboration with it, my own experiments lead me undoubtedly to think that Dr. Burrows expresses the truth when he says that hemorrhage and posture have a decided influence on the quantity of fluid within the cranium, for in lieu of my experiments and I found that the quantity of the same increased when the blood was diminished; in fact I found no reason whatever in any of the rabbits, and certainly think it would be contrary to all we know of effusing serum, to suppose, that it should take place from unusually empty vessels, instead of from vessels more than usually distended with blood.
Besides conclusions drawn from these experiments on animals, there are many circumstances which must have occurred to or at least be familiar to most people, which favour the idea of a varying amount of pressure at different times, such as for instance at the starting of the eye, where anything obstructs the flow of blood from the head, turning lead a little too of severe, a throb of pain may be felt with each pulsation of the heart, which gives precisely the idea of expansion of the artery and compression of the brain. The influence of position in hastening or arresting syncope during blood letting, also favours the idea of varying pressure in different circumstances. If a person be bled in the recumbent posture, it is well known that a much larger quantity of blood may be taken before syncope occurs, than when blood is taken in the erect posture, and this I think may be explained by supposing that in the former case position diminution of pressure sooner occurs, rather than in any other manner as for instance by supposing that syncope occurs more rapidly when erect.
picture, because the patient is not only exhausted by the loss of blood, but is also at the same time fatigued by the muscular effort required to maintain the erect posture. It seemed related to a case of interest, in which I think throws some light on the true nature of syncope. He had a child under his care about 6 months old in which a concentricous protrusion had been present from the time of birth, in the centre of the occipital bone, this communicated with the cavity of the cranium, and was distended with the cerebro-spinal fluid. Mr. evacuated this a portion of the fluid with a view to bring the back on a level with the surface of the bone. After a very small quantity of fluid had escaped, alarming syncope occurred, which I attributed to nothing but the diminution of the pressure on the brain, for the puncture of the cyst could hardly have been perceived by the child, and the stimulus to the heart's action had not been removed as in the case of bloodletting, and yet the syncope supervened.
almost immediately, here however the pressure on the brain was at once diminished, the fluid coming direct from the cavity of the cranium, instead of was gradually, and from at the same time the system at large as it does in the case of bloodletting. I must hope that this long preamble will not be deemed impertinent to the subject of this paper, as it must obviously bear closely upon it. I think, I am however in spite of these experiments inclined to think that in the human cranium the variations in quantity of the blood are much less than in such animals as rabbits. The human skull is as doubtless more upon an unyielding bony case, and the compression which the heart can at any time exert on the cerebral substance must be very fleeting, the difference in the amount of blood may in the human subject may, I think to be attributed to the expulsion of a certain quantity of the cerebral fluid into the special canal, or even to descent to a certain extent of the cerebral substance itself. In rabbits however as I said before I failed in any case to find serum alest
consequently in them with an explanation and the above cannot hold.

Then we consider the extremely delicate cells of which the central matter is composed. I think it cannot be matter of surprise that a slight increase in the quantity of blood or even a difference in the relative quantities of venous and arterial blood, should prove hurtful, by giving rise to an unequal pressure at different parts of the cerebral substance and thus materially altering the shape of and distorting certain sets of vessels, thus probably rendering them unfit for the discharge of their functions. Why however this should occur in one case and not in another, is a mystery. Here can be no doubt however that the alteration of the relative amount of blood in the veins and arteries must have the effect of causing increased pressure on certain parts of the brain.

Dough various diseases of the heart have been found associated with epilepsy so frequently, as to give rise to the idea of a close connection existing between them, they cannot all be supposed to give rise to...
it is exactly the same manner. I shall therefore go through the various diseases of the heart, supposed to be connected with apoplexy, varicose and considerationally that their modes (pirandi) might be expected to be a priori.

In the first place simple hypertrophy of the left ventricle, does sometimes occur, independent of organic disease, resulting probably from a kind of chronic inflammation of the substance of the heart and independent of any valvular disease. In such a case we can easily imagine, that the organ, acting with an increase of force and without any valvular obstruction to the flow of blood, from its cavity, must have a great tendency to thicken, and even to rupture the vessels of the brain. I know accordingly that such persons are extremely liable to active hemorrhage in various parts of the body, they have a flood consciousness, a full strong pulse at the wrist, they are liable to pain in the head, seclusion, various cutaneous <!--\text{ }-->
flashers of light before the eyes, and other
symptoms of central disturbance. Mr. Bicheler thinks this the most common cause of apoplexy, and fails to mention any diseased state of the valves, or arteries of the brain. He should however expect to find rather congestive apoplexy as a result of this disease than rupture of the vessels, as there may be supposed to be free from that most common of all causes of rupture, atheromatous or calcareous degeneration. It were simple hypertrophy. Then however the hypertrophy of the left ventricle depends upon disease of the valves. The case is very different, here it is true the hypertrophy is to some extent an effort of nature, to enable the heart to overcome an obstacle, but whenever it has felt the untold capable force of pulse, in some of the sufferers from this disease, Mr. Bicheler must confess that Nature seems to take the lead of the disease. In such patients the radial pulse, strikes the fingers like a thick cord, and every artery may be seen pulsating with extraordinary force and turbulence. Then at the same time we remember Matthew
ossific and atheromatous deposits which have affected the valve of the aorta lead, very frequently affect the arteries of the brain, depriving them of their elasticity and destroying their structure, we should be surprised that rupture of these vessels should be the result, and extensive clots of blood be effused into various parts of the brain. If the hypertrophy is dependent on disease of the mitral valve, rendering it incapable of closure, there will result obstruction of the flow of blood from the right side of the heart, and consequent obstruction to the return of oxygenated blood from the brain. We have already stated that whenever powerful pulse as in the last case, its force is broken but it is a sudden stroke, and it forces blood, be it remembered, into vessels which cannot freely empty themselves by reason of an obstruction, so that we may still expect rupture of the arteries, but more frequently effusion of serum from the vessels. It appears accountable that if hypertrophy of the left ventricle, more especially the simple simple hypertrophy, do cause apoplexy.
That violent exertion, during which the heart pumps with great increase of power, the blood toward the brain, should not—more frequently cause the disease than I do; but this may in some measure be accounted for in the first place the apoplectic fit seldom occurs, even in those suffering from cardiac disease, unless the hypertrophied organ be excited to increased action by some cause, or unless its force becomes impaired. The same is impeded to be the return of the blood from the brain. The hypertrophy is here certainly the predisposing cause, but the exciting cause is something which becomes the action of the hypertrophied heart, or prevents the return of serious blood from the brain which is much the case thing. We have then the action of the already hypertrophied heart, increased in force by excitement, acting on vessels already stretched to the utmost, and deprived of their elasticity or whose coats are thrombosed or calcareous matters have been deposited, rendering their baffle as porcelaine or soft almost asph
Hypertrophy of the right side of the heart, is occasioned in the same way as that of the left, either by some obstruction to the flow of blood from its cavity, by narrowing of the orifice of the pulmonary artery, or by incompetence of the auriculo-ventricular valves. It is easy to see how obstruction to the flow of blood from either of these causes, must give rise to congestion in the head, and we have at the same time the left ventricle propelling blood with undiminished force into vessels already full, and which cannot be freely emptied in other parts of the body. This affection of the heart, gives rise to passive dilatation, and effusion of serum, in different parts of the body, and of the brain in to a certain extent, subject to the same laws with regard to its circulation, as other parts. We should expect therefore things to take place in the brain. From the limited observations however which have been able to make, I should say that in a great number of cases, the heart disease, and the apoplexy, are the result of the same thing.
of the blood, or perhaps to a diseased state of nutrition, which leads to the deposition of aberrant or calcareous matter in the valves of the heart, destroying their function, and so growing use to suffer great disease of that organ, or in the arteries of the brain, and other parts, tending their unusually liable to rupture, and perhaps also to excite the serous parts of the blood. This change in the structure of the arteries of the brain, is much more common in old people than in young, and hence one reason certainly of the more frequent occurrence of apoplexy in the one than in the other. This change may occur in the arteries of the brain, without affecting the valves of the heart, or aorta; we shall nevertheless have a tendency to apoplexy even in this case, should anything give rise to an inordinate increase in the action of the healthy heart.

Here are certain circumstances, which for ages have been known to be peculiarly liable to cause apoplexy, which may afford additional evidence
in favour of the connection between those of the heart and apoplexy. All of them either increase the flow of blood towards the head, or obstruct its return. Therefore in the first place mental excitement is known to be a very frequent cause of apoplexy, and is always strictly forbidden to those who have the apoplectic tendency has shown itself or is suspected, it is well known to increase the heart's action, and that here lies its danger. Much there can be no doubt. Violent exercise which has the same effect on the heart's action, is also peculiarly dangerous to persons apoplectically inclined. The warm bath is at once remarkable as a stimulus to the heart, than as attended with a peculiar danger to those people. On the other hand, straining, the lifting of heavy weights, stooping, tight waist clothes, have all the effect of obstructing the return of blood from the head and are consequently a somewhat different case, but almost as certainly dangerous to persons inclined to apoplexy. These are facts with which acknowledged
all, and by analogy should we not expect to find diseases of the heart, which tend to increase the violence of the flow of blood towards the head, or obstruct the return from it to have the same effect. Having now stated what might be expected theoretically, I proceeded to the consideration between diseases of the heart and apoplexy.

I gave some statistics in a tabular form, which I thought prove almost to a demonstration the fact, and I hope was not far from right when I said, that so close is the connection between the two, that they hold the relation almost of cause and effect. In the first table I give the percentage of diseases of the heart in cases of apoplexy, as ascertained by some of the most recent authors on the subject. The particular disease of the heart is not mentioned in the table as fortunately, which is taken from Burrow's work.

<table>
<thead>
<tr>
<th>Author</th>
<th>Cases</th>
<th>Diseased Heart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coudrin</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>Hope</td>
<td>34</td>
<td>23</td>
</tr>
<tr>
<td>Burrow</td>
<td>34</td>
<td>23</td>
</tr>
<tr>
<td>Guillenin</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

Total: 132 - 84 - 63.6
In the next table the relative frequency of hypertrophy with valvular disease, simple hypertrophy, and simple valvular disease, are given in 59 cases of apoplexy recorded by Audral and Brownowd.

<table>
<thead>
<tr>
<th>Number of Cases</th>
<th>Heart disease</th>
<th>Hypertrophy</th>
<th>False disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audral</td>
<td>35</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>Brownowd</td>
<td>34</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>38</td>
<td>19</td>
</tr>
</tbody>
</table>

A question, however, still more interesting, is whether a particular kind of heart-disease, is associated with a particular form of apoplexy, or more frequently than with any other form,—whether for instance cirrous apoplexy is more common in obstructive disease of the heart, as relative to the brain,—and congestive, or hemorrhagic apoplexy, with in simple hypertrophy of the left side, with or without valvular disease. I have endeavoured to make a table giving such information as this, but the statistics of a hospital are not favourable for it. The result of a number of cases occurring in private practice, where these are more frequent, and where the symptoms would be more easily
ascertained, would be the proper material for constructing such a table.

Through the kindness of Dr. Gairdner I had the opportunity of examining several of the books containing the records of post-mortem examination, and have collected eight cases of apoplexy in which both the head and the brain were examined, and subjoin a brief account of each of these.

I. Case of severe apoplexy, with also somewhat more enlarged than natural size of heart disease, and no atheromatous deposits mentioned.

II. A thrombotic clot found in one of the lateral ventricles, slight atheroma of the aorta, no cardiac disease, and no atheromatous deposits mentioned, an occurring in the cerebral arteries.

III. Severe apoplexy; heart normal, no mention made of the state of the arteries.

IV. Hemorrhage into Right Eusy the aorta, atheroma of the arteries. Hypertrophy of the heart, chiefly of the left side, weight 14 oz., signs of former pericarditis invisible.

V. Convalescent partial paralysis, increased arterial and subarachnoid effusion, arteries of the base of the brain atheromatous, liver fatty, no cardiac disease.
VI. Subarachnoid space over the anterior lobe of the brain was found to be filled with hemor-
rhagic extravasation, clots were also found in the substance of the brain, arteries at the
base atheromatous, heart enlarged, weighing 13.02; left ventricle chiefly enlarged, aortic
and mitral valves competent, but studded with atheromatous deposits.

VII. Leucomatous, brain diminished in size, heart natural, state of arteries not mentioned.

VIII. Sanguineous, subarachnoid effusion consequent on a fall, aorta slightly atheromatous, no
cardiac disease.

If it be allowed to draw conclusions from so limited a number of cases, it certainly would
seem that the atheromatous deposits in the aorta of the arteries is more frequently
associated with apoplexy than with cardiac disease; for we find that in five out of the eight
cases recorded above the state of the arteries was diseased, whilst in only two was there
cardiac disease present; there are both cases of hypertrophy of the left ventricle, and
decrease in both cases with the atheromatous condition of the cerebral arteries, as we
should have expected ethid, the apoplexy was
precedesent on an erroneous effusion in both
these cases, no doubt from rupture of a vessel.
Of the four cases, four cases apoplexy mentioned
three are independent of the diseased state
of the arteries, and all are unassociated
with cardiac disease; the two might hardly
in some measure have been expected to be
the case, for there passive effusions may result
from obstruction of flow of blood through the
lungs from any cause, independent of cardiac
disease: emphysema, chronic bronchitis,
tubercle, might just owe to this obstruction,
and consequent congestion of the brain, followed
by erroneous effusion as occurs in this part
from the same cause.
From the table before given then and from
considering the rationale of the a class of cardiac
disease, I think it may be concluded, that
there is a close connection between apoplexy
and various cardiac diseases, and the
question now comes to be has anything
been gained in a practical point of view by
the discovery of this connection? Certainly
Much there has, and that it is useful all
and more interesting to the pathological than to the practical physician. To be aware of the tendency to a disease, and often causes of that tendency, is a point of much importance, even a disease unjustly bemoaned which though incapable of being cured when the disease is fully developed, yet by timely caution may with very great certainty be prevented; even the much dreaded disease Phthisis Pulmonalis is a good example of this. Here therefore we meet with disease of the heart which has vascular disease, more especially where it has apparently, supervened gradually without any symptoms of inflammation, and where the sufferer is advanced in life, we may be assured that there is a tendency to a disease which may be actually brought on by any of those exciting causes of phthisis mentioned in a former part of this paper. We ought then to induce the patient, although he may have as yet suffered from no symptoms of cerebral disorder, to avoid every thing which can excite the circulation or cause an impediment to the return of blood from the head. If the action of the heart be excessive...
it may be reduced by means of an unstimulating or low diet, by sedative medicines, or even if accompanied by cerebral disorder by small local bleeding or blisters in the cardiac region. When the attack of apoplexy has however come on, does the presence of cardiac disease in any degree modify our treatment? I do not very materially think, but it must be kept in mind that excessive bloodletting in vascular disease of the heart, caused by showc, it will be extremely likely to cause fatal syncope, we must therefore bleed with caution. Dr. Burrow, from the result of his experiments, is inclined to think the posture of the patient of great importance, and if course recommends that the patient's head should be well raised anything that may obstruct the venous circulation at the same time being removed from the neck, in this attitude most physicians will agree with Dr. Burrow.

W. I. P. Broadbent

March 29th 1852.