

## CASE OF DIFFUSE PULMONARY APOPLEXY, WITH RUPTURE OF THE PLEURA, AND HÆMATHORAX.

By STANHOPE TEMPLEMAN SPEER, M.D. Edin., etc.

CASE. W. B., an individual in reduced circumstances, 62 years of age, had for some time been in a weak state of health, when he was suddenly attacked, in the month of February 1851, with most alarming orthopnœa, extreme distress, lividity of countenance, together with symptoms resembling a fit of congestive asthma. These in a great measure subsided, and when seen by me, on the third day after the attack, the following was his condition. There was still considerable dyspnœa, unaccompanied by pain, but by a sense of weight, heat, and constriction in the chest; there was cough, with very scanty viscid mucous expectoration, untinged by blood; the respirations were twenty-eight in the minute: the pulse was small and irregular. A physical examination gave evidence of a certain relative amount of dulness over both lower lobes, as compared with the upper ones; while, in these especially, there were heard some distant bronchial râles, principally of the dry kind. The expiration was considerably increased, both in length and loudness, while the inspiration was comparatively feeble, both murmurs having a rough, harsh character; these signs were the same on both sides, and were more marked in front than behind. The attack lasted a fortnight, and gradually subsided, without any change in the character of the râles, and with but little in that of the expectoration. No signs of solidification of the lung could be detected; and the case throughout manifested a remarkable want of coincidence between the extreme severity of the symptoms, and the comparative want of confirmation derived from the physical signs.

It is, however, worthy of remark, that the heart's dulness on percussion was totally unappreciable; and that the respiratory murmur was heard over the entire space usually occupied by the uncovered portion of that organ. Its impulse was imperceptible; and its sounds, which could scarcely be detected, but by making the patient hold his breath for a few seconds (a process which could only be adopted towards the latter end of the attack) shewed that irregularity of action existed; this was confirmed by the character of the pulse, which (as before said) was small, feeble, and irregular from first to last. No murmur accompanied either sound.

Although the cardiac symptoms, with the exception of the irregular action, were of a negative character, I entertained a suspicion that the sudden attack of orthopnœa, with the symptoms of pulmonary congestion, were in some measure dependent upon the condition of the central organ of the circulation, which probably was softened or attenuated.

The patient recovered slowly from the immediate effects of the attack, and had resumed his usual occupations (never indeed of a laborious nature), when, on the 16th of May, about three months from the previous seizure, while slowly walking across a yard, he suddenly stopped, threw up about a couple of quarts of dark blood, and expired before medical assistance could be of any avail.

**NECROPSY TWENTY-FOUR HOURS AFTER DEATH.** On opening the thorax, the lungs did not collapse; they appeared to be of great size, filling the whole of the cavity, which seemed scarcely able to contain them. The heart was completely hidden. And the whole surface of both lungs was of the deepest red colour; the right one, when removed, presented a perfect specimen of uncircumscribed pulmonary apoplexy, its entire substance being gorged with very dark coloured blood, which, upon making incisions into the lung, flowed out freely from every part. The substance of the organ was soft and pulpy, as if it had been soaked in blood; while its structures seemed completely obliterated, so great had been the effusion into them. The left lung presented the same appearances, if possible in a still higher degree; in its lower lobe, and at its posterior aspect, the pulmonary tissue was found completely broken down into a soft friable pulpy mass. Corresponding to this portion, was found a rent in the pleura, two inches in length, through which upwards of a quart of blood had escaped into its cavity.

To account for this rare occurrence, no traces of disease of the lungs besides those mentioned could be detected. The bronchial mucous membrane was pale; and, although the tubes contained fluid blood, there were no other morbid appearances connected with them. At the right upper lobe, there were traces of sub-pleural emphysema. The large vessels were all carefully examined, but no aneurism or rupture of any kind could be detected. The aorta itself was quite healthy, but of rather small calibre, as compared with the volume of the pulmonary artery.

The heart was found driven deeply backwards into the mediastinum, by the pressure of the distended lungs. Its valves were all perfectly sound and competent. The muscular substance, however, afforded proofs of disorganisation; it was of a pale yellow colour externally, and for about one-third of the thickness of its wall, when incised. When handled, it was found to alter its shape with great facility, and could be moulded and kneaded in the hands like dough. The walls of the ventricles were soft, flaccid, easily ruptured, and afforded an example of that condition designated as yellow softening of the heart. No superfluous fat was found around it, and its cavities were rather larger than usual.

**REMARKS.** The case just narrated, is undoubtedly one of very rare occurrence; and but few similar ones are to be found on record. One is related by Corvisart, in his translation of Avenbrugger; the second by Hohnbaum, as mentioned in Dr. Forbes's translation of Laennec; another is to be found in the *Clinique Médicale* of Andral; and a fourth is given by Dr. Fergusson, in the first volume of the *Dublin Medical Transactions*. Others doubtless exist, but to the particulars of these alone have I had access; and I find that each observer has remarked the rarity of the occurrence. The four cases just alluded to, all agree with the one narrated above, as regards the appearances found after death. In each, the whole or a portion of the lung was the seat of uncircumscribed pulmonary apoplexy, with breaking down of the lung, laceration of the pleura, and escape of blood into its cavity. During life, moreover, the symptoms were strikingly similar; a sudden shock,

succeeded by a rapidly fatal termination, being the leading features of each case. The principal difference being the absence of external hæmorrhage in two of them.

It is worthy of remark, that in none of the instances were there to be found those cardiac lesions which are so commonly supposed to accompany the circumscribed variety of pulmonary apoplexy; and, in the absence of these, it becomes an interesting inquiry, as to the cause of this condition in the cases which have just been quoted, as well as in the one which forms the subject of this article.

Since the year 1816, when this affection was first noticed, three hypotheses have been hazarded as explanatory of these sudden and copious effusions of blood into the tissues of the lung and pleural cavity; namely, *a.* Paralysis of the Pulmonary Plexus of Nerves; *b.* Diminished Coagulability of the Blood; *c.* Dilatation of that Fluid itself.

**PARALYSIS OF THE PULMONARY PLEXUS** was advocated by Lorinser, and other pathologists of the German school; and was supposed to act by producing a comparative over-action of the vessels of the lung (*Vide Forbes' Laennec*). The theory in itself does not appear to have undergone much investigation; but it not improbably has some foundation, inasmuch as the occurrence of sudden attacks of local paralysis in other parts is well established. Too little, however, is known on this subject, as applied to the cases in question, to say anything very definite regarding it.

**DIMINISHED COAGULABILITY OF THE BLOOD.** We have reasonable grounds for attributing many instances of passive hæmorrhage into the substance of the lungs, to such a condition of the circulating fluid; and the existence of extravasated blood in the lungs of those dying of purpura, is an argument in favour of the diminished coagulability of the blood being occasionally a predisposing cause of the diffuse form of pulmonary apoplexy. But in cases like the present, such a condition alone can scarcely be supposed adequate to the production of such results. Extravasations of blood, the simple result of diminished coagulability, are invariably of a passive nature; they have all the appearance of gradual formation, and are for the most part accompanied by certain other indications of a purpurous or hæmorrhagic diathesis; or, if that be not the case, they are found after death to have existed in conjunction with advanced cardiac disease, which, in such cases, had by its long continuance so deteriorated the quality of the blood, as to render its escape from the pulmonary capillaries, and its gradual infiltration into the parenchyma, a condition very analogous to the true purpurous extravasation.

**DILATATION OF THE BLOOD.** The morbid appearances found in three cases of severe apoplexy of the lung, occurring suddenly, and with such severity as to merit the term "*apoplexie foudroyante*" of the French writers, would then appear to suggest the existence of some sudden change, acting either immediately upon the mass itself of the circulating fluid, or through the intervention of its nerves:—consisting either in the withdrawal of a certain pre-existing influence, as in the pulmonary paralysis of the Germans previously mentioned; or in the accession of a new and unaccustomed influence, of which but little notice has ever been taken, but which Laennec considered it

necessary to admit in certain cases of sudden, profuse, and otherwise unaccountable hæmorrhage; namely, dilatation of the blood itself.

Now, without venturing to affirm that such a phenomenon does actually take place, I cannot avoid entertaining the idea, that in a fluid of so complex a nature, possessing such essentially vital qualities, and undergoing such changes as does the blood, whether in health or disease, modifications of bulk, independent of additional material, may, under favouring circumstances, really take place; while, on the other hand, a similar condition may equally be the result of an addition to one or other of the elements of the blood, more especially to the globules. The existence of local plethora is not of unfrequent occurrence; and the great increase in the amount of the globules has been proved to be its characteristic peculiarity; but whether the active distension of the blood-vessels, which exists under these circumstances, be owing simply to the mechanical influence of the augmented globules, or to an increased vital activity in those processes reciprocally existing between them and the more fluid portions of the blood, is not certain. What we know is, that an increase in the number of one of its most important ingredients (the globules) is the distinguishing mark of plethora. Something is in excess; and that excess is equally proved to be a predisposing cause of one form of hæmorrhage. If, therefore, it is in this sense of the word that we are to understand dilatation of the blood (with its similar process to give rise to such effusions) the term does not appear to be so misapplied as we might at first sight suppose.

If, however, we are to understand by dilatation of the blood, a vital change in that fluid, by which (without any extraneous addition being made to its bulk) it occupies or requires a larger containing space than before, we are thrown upon pure hypothesis. Yet, as before stated, the fact does not appear absolutely impossible; for, to quote the words of Dr. Wood of Philadelphia, "The blood may become diseased by a change in the character, as well as in the relative quantity of its constituents, and this independently of the entrance into it of any foreign principle. In what way such changes are effected is not precisely understood. There are not wanting facts to show that they may be produced by the action of the nerves. If, under perverted nervous influence, the products of secretion performed in the capillaries may become unhealthy, as is generally believed, there can be no difficulty in admitting that the blood itself, in these capillaries, may undergo alterations from a similar cause. If nervous action be, as some suppose, analogous to the galvanic, we can readily understand that it may be capable of modifying the condition of the vital fluid submitted to it, in the extreme vessels, as water is decomposed when placed between the poles of a galvanic battery. We may conceive, also, that the constituents of the blood may be modified by the varying condition within the body of those subtle principles, which exercise so powerful a chemical agency without it—namely, heat, light, electricity."

If, therefore, such a condition of the blood does occasionally take place, as its actual dilatation, its cause should, I conceive, be sought for, and connected with, certain modifications of atmospheric and electrical influence. The effects of these upon homogeneous fluids are by no means trifling; but upon a fluid such as the blood, they must, in all

probability, be considerable; and in relation to temperature, the idea would appear to be borne out by the prevalence of those states of the body, characterised by plethora and increased vitality of the blood, during the first accessions of summer heats. This is indeed a fact so generally believed, that few countries are to be found, the inhabitants of which are not in the habit, at this time of the year, of taking measures for diminishing the mass of the blood, whether by baths, venesection, purgatives, vegetable diet, etc.; hence, again, the custom of many of our ancestors of undergoing a precautionary loss of blood in the spring. I have moreover remarked that, as a general rule, the most severe and numerous cases of hæmorrhage occur at the commencement of the first summer heats. Of ten very severe cases, which I have seen since last October, all occurred within a space of two months, from the middle of April to the middle of June; and my own experience has led me to notice a preponderance of such cases every year at the same period.

With regard to the influence of electricity upon the blood, much also may be surmised, if little be actually known. It is well known, that bodies in a similar electric condition have the power of repelling one another; and it has been supposed that the circulation is aided by the electric state of the blood. In his valuable little work on *Electricity and Galvanism*, Dr. Golding Bird says: "That if a vessel containing water, having a very small hole in its base, be connected with the prime conductor of an electric machine, the water will merely escape by guttation; but on setting the machine in action, the particles of water becoming similarly electrified, repel each other, and the fluid escapes in a continuous stream. In accordance with this fact, it was long ago shown, that if a patient have a vein opened in the arm, and the blood happens to escape but sparingly, on placing him on a glass stool and electrifying him, the blood will, like the water in the vessel just alluded to, escape *pleno rivo*." Holding this fact in view, and remembering the difficulties that have always been experienced in explaining the capillary circulation, we may possibly have another clue to those perturbed conditions of this circulation (independent of any change in the functions of the central organ), which so frequently occur at a season of the year, when undoubtedly great electric changes are going on in the atmosphere; but here again we are forced upon a supposition as to the *modus operandi* of this agent on the circulation. It is possible to conceive, that the particles of the blood being highly charged with electricity would tend to repel each other; but this in itself would not contribute to produce onward movement in the whole bulk of the fluid. It would certainly cause a separation of the particles one from another, but this might take place in one direction with as much facility as in another, and thus no assistance of an impulsive character would be derived from it. But the blood being subjected to a considerable amount of *vis a tergo*, the repellent action can only act in one direction, since those particles which might otherwise tend to retrograde, are entirely prevented from doing so by the bulk of the fluid behind them, urged onwards by the motor power of the heart. In this way we may conceive, that the electrical repulsion of one set of particles is exercised upon another, which, from mechanical causes, is unable itself to develop this property; and hence the repellent power

becomes merged in one continuous onward wave, the first impetus to which is given by the heart, and is then maintained by the electrified particles shunning one another; and as they can only do so by moving in one direction, a continuous circulation is thus kept up. It is needless to add, that the above can only be considered in the light of an hypothesis, and as such, may be taken for as much as it is worth.

In two cases of pulmonary apoplexy related by Hohnbaum, the appearance of the lungs, and the symptoms, both prior to, and at the moment of the fatal event, both pointed to the existence of a condition of the blood, very different from that which would indicate diminished coagulability alone as the cause. In these instances, the individuals had both suffered from symptoms of plethora; they had both lived in a manner capable of inducing and keeping up such a condition; and, in both, there was evidence of derangement in the pulmonary circulation, as evinced by dyspnoea, contraction of the chest, and paroxysms of asthma. When examined after death, the lungs, in both instances, appeared too large for the cavity of the thorax, so dilated and gorged were they with the immense accumulation of blood in their tissues, while in neither case, was there any disease of the heart or other organ found, to explain the morbid appearances; and whether these are to be attributed to some modification of the blood itself, or to a sudden palsy of the pulmonary nerves, (as suggested by the narrators), must necessarily be a matter of uncertainty; probably the two causes may have acted simultaneously.

The following case, although not of a fatal nature, presented certain symptoms so identical with those which preceded death in those previously mentioned, as to merit a slight outline. A gentleman, of middle age, and in perfect health, while occupied in his bed-room, suddenly experienced a pain in the chest, and fell senseless on the floor; he remained in this condition for nearly twenty minutes, and when consciousness returned, he found himself free from headache or any other cerebral symptom, but his breathing was short, he had dull pain in the left side, a small, quick, thready pulse, great anxiety and uneasiness, and altogether he presented a very unpromising appearance, especially in relation to the thoracic symptoms; these, nevertheless, both in their invasion and in their combination, were of so anomalous a character, that it appeared difficult to refer them to any of the more ordinary diseases of that cavity. A physical examination was not much more satisfactory; the left upper lobe, both before and behind, was the seat of rough and diffuse bronchial breathing, with an obscure sound of crepitation, which did not resemble the ordinary moist sounds usually heard in the tubes or air-cells. There was also slight comparative dulness over the same part; the right lung presented nothing abnormal, and the heart appeared perfectly healthy. These signs underwent no alteration of character, but gradually subsided, still, however, preserving their somewhat anomalous character; inasmuch as, neither from their own evidence, nor from that of the symptoms, could the ordinary phlegmasia of the lung be diagnosed; while, on the other hand, there was enough to show that the affection was not a purely nervous one. The mode of invasion, (which I learnt fully some days after first seeing the patient), precluded the idea of previous chronic disease, besides which, his health had been perfectly sound for a length of time.

Coupling therefore these circumstances with the sudden shock, the sensations in the chest, the anxiety, small rapid pulse, but absence of true febrile symptoms, and the physical signs, I surmised the existence of a latent pulmonary apoplexy, depending (as I cannot forbear imagining) upon one or other of the causes just alluded to. Had there been any visible hæmorrhage, I should have felt certain as to the nature of the attack; but it is well known that this is not a necessary accompaniment of pulmonary apoplexy.

I may add, that this individual recovered perfectly, and subsequent examinations served only to confirm belief in the gradual absorption of blood extravasated into the intervesicular structure of the lungs. Had this case proved suddenly fatal before the return of consciousness, it would have been attributed to a cerebral affection in all probability; and it is not unlikely, as Dr. Forbes remarks, that this error may have frequently been committed under similar circumstances.

With regard to the case which has formed the subject of these remarks, it would appear a matter of equal difficulty, to explain satisfactorily the sudden occurrence of so extremely severe an attack of pulmonary apoplexy. Reasons, however, might be adduced for attributing it, in part, to each of the conditions suggested as capable of producing it. The sudden shock might be owing to the supervention of the pulmonary paralysis of the authors previously mentioned. The appearance of the lungs on dissection, gorged and distended with dark blood, might suggest the probability of an increase in the bulk of the fluid; while the apparent absence of coagulability, the manner in which the blood flowed from every incision, together with the character of that which was found in the pleura, might lead to the supposition that diminished coagulability had likewise a share in the phenomena observed upon dissection; more especially when taken in connexion with the fact, that the individual had been in early life, and, indeed, up to within a few years of his death, in easy circumstances, but that during this latter period, the change in his mode of living, his diet, etc., had been of a very inferior description, and perfectly sufficient to account for any impoverished condition the blood might have undergone. His cachectic appearance, moreover, tended to countenance such an opinion.

The softened condition of the heart may have had a passive share in the production of the hæmorrhage and its consequences. It has been found to exist, independent of any inflammatory process, in cachectic persons; and what is more to the point, has been shown by Dr. Hope to be very influential in the production of pulmonary apoplexy. In three cases of softening, detailed in the last edition of his *Treatise on Diseases of the Heart*, two gave evidence of most extensive apoplectic effusion; and he alludes, in addition, to several other cases of the same kind. The principles upon which he states this lesion to act are the following. The left ventricle, weakened and generally attenuated in its parietes, becomes unable to expel its contents; an obstacle is thus offered to the entrance of blood from the left auricle, and this at once produces an obstruction to the free disgorgement of the pulmonary veins, and a consecutive retardation of the whole pulmonary circulation. If, then, we admit that in the case narrated above, a similar condition of the lungs existed habitually, in connexion with a softened heart, it is no longer difficult to believe that a sudden change, whether in the bulk

of the fluid itself, or in the nervous influence regulating its distribution, might cause a general exhalation of blood into the various tissues of the lungs, more especially if (as is not improbable) a previous tendency to diminished coagulability had rendered its extravasation comparatively easy.

In intimate connexion with this subject of the dilatation of the blood, I may mention that, since the preceding remarks were written, I have had my attention directed to the fourth chapter of Dr. Cormack's *Prize Thesis on Air in the Organs of Circulation* (Edin. 1837), entitled "Remarks upon the Generation of Air in the Living Body, especially in the Blood-Vessels; with observations on the consequences which may result from its presence there". He shows that "there are various facts and arguments, which render it exceedingly probable that, owing to the sudden formation of air within the blood-vessels, death may be produced either by arresting the contractions of the right side of the heart, or by producing a fatal action on the brain."

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## ON SOME DIFFICULTIES IN THE STUDY OF HYSTERIA.

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THE Benevolent Power presiding over universal nature, has determined that, for the most part, diseases dangerous to animal life should quickly attain a crisis, in the recovery or death of the sufferer. Of such diseases, whatever may be the theory of their treatment, the course is apparently settled, the reasoning upon them clear and simple, and the result, from its rapidity, in some measure satisfactory to the spectator. But there is another class, whose continued presence is quite compatible with animal being; and of these, as it is their property to remain without full destruction to the organs they disturb, so is their progress unsatisfactory, and the means taken for their removal uncertain, conjectural, and obscure. In these, the physician provides himself from all sources, and from his personal experience (contracted as far as possible to obtain concentration), with certain types, or ideals of diseased states, from which he insensibly selects one, towards which the case before him appears most to approximate; for, in reality, he must rest satisfied with such an approach to truth, as an escape from the extremes of useless scepticism, and blind credulity. Hysteria may be placed among this class, as one of the most difficult; so much so, that a perfect treatise on hysteria would comprehend within itself the primal foundations on which the structure of medicine, as an art, must finally be raised. I say as an art, in opposition to its popular development as a practice, each requiring a different constitution of mind; to the perfection of the former, self-distrust being as conducive, as self-confidence is necessary to the latter. The modes and processes of the human intellect are not favourable to the exact study of this class of diseases. There is a tendency in our minds, by their levity and volatility, to overlook with ease all the many failures in dreams, charms, omens, and prophecies, but obstinately to remember the very few that are successful. Now the opposite state is required; we should have the capability of