connected with the anterior and upper part of the transverse part of the arch of the aorta, and projecting forwards in front of the innominate artery and the left carotid—the left subclavian apparently coming off immediately to the left of the sac itself. The sac extended forwards so as to be closely adherent to the under surface of the sternum. The anterior and lower walls (immediately adjacent to the sternum) were almost as thin as tissue-paper, extremely soft and infiltrated with blood. (Some blood appeared to have passed through a minute aperture in this very thin tissue into that of the anterior mediastinum, with which it was continuous). The ascending aorta was slightly and uniformly dilated; and the same condition appeared to exist, though to a somewhat less extent, in other parts of the arch. On opening the aorta from the posterior surface, a rounded opening (an inch and a quarter in diameter) was seen in the situation before mentioned leading into the aneurismal dilatation—the left subclavian coming off direct from the aorta just beyond the sac, the innominate arising completely outside the sac, but posterior to it, and the left carotid taking origin just within the sac itself. The descending portion of the arch, as well as the thoracic aorta, seemed to have undergone slight general dilatation; and the coats throughout, from the aortic valves downwards, had quite lost their natural elasticity. The internal surface also was notably irregular from wrinkling, and the presence of numerous opalescent and whitish, more or less flattened, elevations above the surface—interspersed with abundant yellowish areas of superficial fatty degeneration. The diminution of elasticity was more marked in the descending than in the ascending part of the arch. The abdominal aorta gradually became more free from morbid changes, and presented an almost normal elasticity. The ilia were also healthy. The internal surface of the aorta was also in most of its extent distinctly blood-stained. On opening the posterior part of the aneurismal sac, it was found that about three-fourths of an inch above its line of separation from the aorta its altered arterial walls gradually thinned away, so as to leave nothing but a layer of condensed connective tissue. The aneurism itself was partly filled with a large, somewhat conical, clot, about two inches and a half in length, by an inch and three-quarters in diameter at the base, weighing almost two ounces. This clot was nowhere adherent except very near the junction of the aneurism with the aorta, where the last layer forming the base of the clot was adherent in several places, so as partially to shut off the sac from the lumen of the aorta. The clot was firm, and of a light reddish colour on the surface. On section, it was found to be colourless within, and most distinctly laminated from above downwards. (The microscopical examination of a hardened portion of this clot subsequently showed that it was composed of a dense felt-work of interlacing fibres of fibrine, containing only a few white blood-corpuscles within its meshes. Here and there, however, aggregations of altered white blood-corpuscles were met with more plentifully amongst the fibres.) After removal of the clot, the following additional particulars were made out concerning the sac and its relations to other parts. It was found that the upper part of the sternum and the adjacent portions of the right clavicle and first rib were completely absorbed: two or three pieces of almost detached bone could be felt forming the wall of the sac itself inside the left sterno-clavicular articulation, and in the situation of the eroded end of the right clavicle. The walls of the sac were formed almost wholly of condensed connective tissue, showing only here and there a small patch of thin and degenerated arterial tunica. The portion of the sac corresponding with the last two punctures through the skin, seemed in no way different from other parts, except that immediately inside the puncture of the zinc needle was a small portion of very firm fibrine, about half an inch in diameter and one-fifth of an inch in thickness, adherent to the wall of the aneurism. This portion of fibrine was similar in character to the substance of the clot, and was of the same diameter as the laminae of its apex. One inch to the right of the situation of the right puncture, there was a minute opening through the attenuated wall of the sac in the situation of the eroded inner end of the clavicle, and a needle, passed outwards through this, traversed the pectoral muscle at the site of maximum blood-infiltration. Two inches below the level of the last punctures (just inside the lower border of the second rib), where the sac projects into the anterior mediastinum, there was also a very minute aperture through the much attenuated coats, by which blood had made its way into the anterior mediastinum. The communication between the left carotid and the sac was now found to be quite obliterated by a thin layer of partially decolorised fibrine, which covered the opening and adjacent parts of the sac. From the mode of connection of the artery with the sac, the blood-flow must necessarily have been much diminished, since distension of the aneurism tended to close the commencement of the vessel. On opening the vessel a thrombus was found, extending from the origin of the artery upwards for two inches: the lower inch of the thrombus was quite decolorised, and firmly adherent to the arterial wall next the

aneurismal sac. The upper portion of the clot was altogether softer, slightly reddish, and terminated in a conical point. There was no notable disease of the coats of this vessel: in the left subclavian were two or three small patches of atheroma, whilst the right innominate and its branches seemed healthy. Firmly adherent to the left border of the sac, close to the carotid artery, was the left pneumogastric nerve. In one part of its extent it was lying at the side of a minute pouch projecting from the sac, whose walls were extremely attenuated (so as to be on the eve of rupture). The walls of the sac in this situation were blackened; and on section of the nerve in the same part, it was found that half of its substance next the little pouch was also notably blackened and softened.

The heart was of normal size, the left ventricle not being at all enlarged. The mitral, tricuspid, and aortic valves were healthy, with the exception of a very slight amount of opacity and increased thickness. The right lung was healthy; there were no patches of consolidation, no evidence of pneumonia, and only a very slight increase of redness of the mucous membrane in the main bronchi. The upper lobe of the left lung was notably emphysematous, especially at the apex and along the anterior portion. The lower lobe was very slightly more solid than natural, and more vascular: the main bronchi were rather more hyperæmic than on the right side. The trachea and commencement of the large bronchi were decidedly more hyperæmic than natural. The liver was of medium size, and apparently quite healthy; no increased consistence; no thickening of capsule. It weighed fifty-nine ounces and a half; the gall-bladder was full. The spleen was somewhat small; its consistence was rather above the average; no thickening of capsule. It weighed five ounces and three-quarters. The kidneys each weighed five ounces and three-quarters; they were apparently quite healthy. The stomach and intestines were healthy; the bladder was full. On removing the calvaria, the dura mater seemed healthy; the vessels of the pia mater were notably turgid; the arteries of the base were healthy. The brain-substance was everywhere of natural consistence, and apparently quite healthy.

[To be continued.]

ON THE CAUSES OF UNAVOIDABLE HÆMORRHAGE DURING MISCARRIAGE OR LABOUR WHEN THE PLACENTA IS PRÆVIA.

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THERE is in obstetrics no subject more important, or which has attracted more attention, than unavoidable hæmorrhage. Its causes, sources, and the mechanism of its arrestment, have been variously described; and most authors, especially those of recent times, base their practical recommendations on their theoretical views on these subjects; and, as the theories differ, so of course do the practices enjoined. The treatment, therefore, in this very grave class of cases, is in an unsettled state; and it will probably remain so until the whole theory of the hæmorrhage is surely established.

I have in former papers* discussed the separation of the placenta when prævia, and the hæmorrhages which take place during the continuation of pregnancy; but the topic of the present paper is beset with more difficulties, and cannot, I fear, be regarded as so well cleared up as those of the preceding.

The hæmorrhage during miscarriage or labour at the full time is the only loss that can be truly called unavoidable; and it is so in two different senses. It is, first, unavoidable because we have no means of preventing it. It is, second, unavoidable, because labour (and here, as well as in future in this paper, we shall include under the term labour both miscarriage and labour at the full term) cannot go on without inducing it. No doubt many authors† take particular care to describe cases without any hæmorrhage; Cazeaux, indeed, says, “without the loss of a drop of blood.” But such statements require consideration, and do not disprove the inevitable character of the hæmorrhage. The placenta is never separated without loss of blood. It is easily conceivable, that a case of placenta prævia may go on in labour without serious loss of blood or great hæmorrhage. The function of parturition is sometimes conducted with so great energy and rapidity, or with so early discharge of the liquor amnii, that such cases, complicated with

* See *Lancet*, Oct. 18, 1873, p. 558; and *Edinburgh Medical Journal*, November 1873, p. 385.

† Mercier, Moreau, Cazeaux, Simpson, Barnes, etc.

placenta prævia, may have very little attendant hæmorrhage. I have repeatedly induced premature labour in placenta prævia without any hæmorrhage occurring worthy of the name of flooding, or without more than is seen in a healthy confinement. Another explanation may account for such cases without flooding; namely, that the part adhering to the area of spontaneous premature detachment, or within the cervical zone of Barnes, may have been separated long before labour. This explanation was long ago given by Jacquemier* and Cazeaux; but it is plain that here the placenta is only nominally prævia. The previous portion of it is no longer attached and useful, but detached, probably atrophied and perfectly useless. Cazeaux† gives the explanation in the following words. "In others, it may be as M. Jacquemier remarks, that the accomplishment of the delivery without accident is due either to the entire separation of the placenta, or to its detachment on one side only to a point just beyond the uterine orifice; so that the dilatation can progress without increasing the detachment, the vessels previously torn having been stopped by coagulated blood."

Still another explanation of absence of flooding is adopted by Jacquemier‡ and Cazeaux,§ who derive it from Moreau; namely, that death of the child some time before the labour, having given rise to coagulation of blood in the placenta, will lead to arrest of the supply of maternal blood to the organ; and that, in consequence, separation may take place without loss. This explanation was adopted by Simpson, but is, I believe justly, contested by Legroux|| and Barnes.¶ I am not at present in possession of knowledge sufficient to enable me to speak exactly regarding it; yet I may make three statements adverse to its acceptance. First, I believe in no mysterious attractive or "sugescant" power in the living fetus or maternal placental vessels, such as is described by Gendrin** and Simpson.†† Second, cases are not rare where death of the fetus is found to have no controlling influence over uterine hæmorrhage, whether accidental, or unavoidable, or *post partum*. Third, the circulation in the maternal part of the placenta does occasionally go on long after the fetus is dead, even after it is decomposed. Although this is contrary to the general opinion of obstetricians, I have been strongly impressed with its truth by a recent case, where, long after the death of the fetus, the placenta was full of fresh blood and healthy-like.

We have no hesitation, then, in saying that, when the placenta is truly prævia—that is, attached when labour begins, to the area of spontaneous premature detachment—hæmorrhage is unavoidable.

The cause of the hæmorrhage is separation of the placenta produced by expansion of the lower uterine hemispheroid in order to form part of the genital passage.

Wherever, within the spontaneously and prematurely detaching area, the placenta may be inserted, the first part of it separated will be that next to the internal os uteri, and the rest successively, as distance from the os is increased, till the latitudinal limit or distance of the extreme parts of the spontaneously premature detaching area from the os internum, or the vertex of the hemispheroid, is reached. This is both clinically true and a consequence of the laws of separation already elsewhere described.

When the placenta is inserted so as to overlie the internal os, hæmorrhage will commence as soon as the expansion of the part of the uterine body next the internal os is greater than can be met by the slight expansibility of the placenta; and this may be simultaneous with the commencement of active or painful labour. Bleeding, however, frequently begins before painful uterine action begins, when expansion is going on under the influence of silent or painless labour. On this subject, I have elsewhere‡‡ remarked. "Practitioners are not frequently called upon to make a vaginal examination just before the obliteration of the cervix begins; that is, generally some days before active or painful labour supervenes. But to this general statement, cases of placenta prævia form an exception. In them, it is well known that, at about the full time, hæmorrhage commences quite unexpectedly. It, in fact, begins with the commencement of the dilatation of the internal os uteri—that is, with the commencement of the ordinarily painless contractions which precede active labour." I might adduce, in illustration of these remarks, many well observed cases that have occurred in my own experience, or that are recorded by well known and accredited authors.

Braun's* opinion that long delay of dilatation of the internal os, even till the end of pregnancy, is a peculiarity in cases of placenta prævia and transverse presentation of the fetus, is, I believe, quite unfounded. He accounts for the peculiarity by mechanical uterine conditions existing in these cases; but, as he does not give sufficient evidence of the truth of what he accounts for, I shall not discuss it.

When the placenta does not overlie the internal os, hæmorrhage will be delayed proportionally to the distance of the placental margin from the internal os. Considerable dilatation may, indeed, occur before hæmorrhage commences, when the placental margin is comparatively distant from the internal os. Such considerable dilatation may be the result of active painful labour, or of silent painless labour. Clinical experience often illustrates these statements. In the last case of placenta prævia which I attended (along with Dr. Macfarlane of Polmont), the hæmorrhage began quite unexpectedly, shortly after the completion of the seventh month of pregnancy; yet, although there was no painful uterine action, separation was caused by painless uterine action, producing dilatation of the lower uterine hemispheroid. The internal os uteri was as large as a florin; and it was not till this amount of dilatation of the internal os was reached, that the corresponding amount of dilatation at some distance from the internal os was sufficient to produce detachment. In this case, premature labour was induced, with a successful result to both mother and child. After delivery, the detached marginal segment of placenta was easily recognised by its peculiar ordinary thrombosed condition.

The delay of detachment and bleeding, in cases where the margin of the placenta only approaches the internal os but does not reach it, arises from the circumstance, which I have elsewhere accounted for, that a detaching amount of expansion is first produced at the margin of the internal os. This does not arise from the absence of expansion over the whole spontaneously detaching area; on the contrary, the expansion will simultaneously affect the whole of it. But, at parts remote from the internal os, the whole or final amount of expansion or dilatation is slight, and it is only when it has reached its maximum, or near it, that detachment of the placenta is produced. At the internal os, on the other hand, the detaching amount of expansion is reached at a very early stage of its dilatation and of labour, whether silent or painful; and, of course, long before the whole or final amount of expansion or dilatation is reached.

The same circumstances account for the renewals or aggravations of the hæmorrhage, which observers uniformly describe as occurring while the early part of labour advances, in all cases of extensive attachment over the spontaneously detaching area. As the lower uterine hemispheroid is dilated and opened up, successive zones, arranged concentrically round the internal os, are, according to distance, successively brought to a detaching amount of expansion or dilatation, till the limit of spontaneous premature detachment is reached. This limit will be, of course, reached when the internal os uteri is fully dilated, and probably sooner; but the reaching of this limit has no direct relations, so far as we yet know, with the degree of dilatation of the external os uteri. The limit of spontaneous premature placental detachment may be attained before the external os uteri is much dilated.

The view of the causation and progress of unavoidable hæmorrhage here just given is that which many long ago held, as the following passage from Ingleby† shows:—"Pain (says he) efficacious as it is in the accidental form of hæmorrhage, unless adequate to the expulsion of the child, is neither to be expected nor yet desired, to any material extent, in the unavoidable form, as it only renders the effusion more abundant. For, though a certain degree of relaxation is necessary for delivery, it must be remembered that, in exact ratio as the cervix uteri is successively developed, and the os internum progressively dilated, will an additional mass of placenta be detached from its connecting medium and hæmorrhage necessarily be renewed." Since the time of Ingleby, and of others equally well informed whom I might quote, much progress or knowledge has been made, many erroneous notions dissipated, and some vague ideas reduced to exactness. It was well known that, in ordinary cases, only the part of the placenta adjacent to the os internum was spontaneously detached in early labour, while that attached higher up retained its uterine connection till the child was born. But some authors, not writing with the care of Ingleby, who speaks of detachment as a consequence of development of the cervix and dilatation of the internal os uteri, appear to wish to describe an unlimited progress of detachment during the whole labour. Even Ingleby is inaccurate and inexact; but he correctly limits the bleeding to the time of the progressive dilatation of the os internum, and he does not, like Churchill, put no bound to the spontaneous premature detachment. The latter author says:—

* *Lehrbuch der Geburtshülfe*, s. 625.

† *Uterine Hemorrhage*, p. 140.

‡ *Theory and Practice of Midwifery*, p. 465, 3rd edition, 1855. In subsequent

* *Manuel des Accouchements*, 1846, tome ii, p. 240.

† *Theoretical and Practical Treatise on Midwifery* (Bullock's Translation), 1868, page 757.

‡ *Manuel des Accouchements*, tome ii, p. 243.

§ *Traité Théorique et Pratique de l'Art des Accouchements*, edit. vi, 1858, p. 701.

|| *Archives Gén. de Médecine*, 1855, vol. ii, p. 646.

¶ *Lectures on Obstetric Operations*, 2nd edit., p. 400.

** *Traité Phil. de Médecine Pratique*, tome ii, p. 275.

†† *Selected Obstetrical Works*, pp. 226 and 238.

‡‡ *Researches in Obstetrics*, p. 260.

"The flooding is the necessary consequence of the dilatation of the os uteri, by which the connection between the placenta and uterus is separated, and the more the labour advances the greater the disruption and the more excessive the hæmorrhage." That there is a natural and early limit to separation and bleeding was well known to Jacquemier,* who writes, regarding the separation and consequent bleeding during pregnancy, as follows:—"Elle peut se manifester lorsque le placenta recouvre l'orifice interne, et lorsqu'il en est seulement plus ou moins rapproché par sa circonférence. Dans le dernier cas, et même dans celui où il recouvre l'orifice par son bord seulement, la perte après s'être produite une ou plusieurs fois, peut cesser définitivement, et l'accouchement avoir lieu à terme sans qu'elle se reproduise. En effet, lorsque la portion du placenta qui avoisine l'orifice ou le recouvre a été décollée, et que l'extravasation sanguine a cessé, la tendance à de nouveaux décollements partiels peut disparaître, parceque les progrès de l'amplication de la partie inférieure de l'utérus éloignent très sensiblement le bord du placenta le plus exposé à de nouveaux décollements du centre du segment inférieur, qui est la partie la plus distendue mécaniquement, et parceque le tiraillement diminue du bord inférieur du placenta au bord supérieur, qui se trouve assez haut dans la cavité de l'utérus." Barnes, however, has distinguished himself by the care with which he has justly insisted on the natural limit of spontaneous premature separation, and has shown that it is not the case, as Churchill says, that the more the labour advances the greater is the separation; the utmost limit of spontaneous premature separation being reached before the first stage of labour is completed. We do not at present enter upon the question, whether or not the hæmorrhage ceases when the limit of spontaneous premature detachment is reached, or artificially hastened, as Barnes believes. This is quite another matter, to which we hope subsequently to direct attention.

[To be continued.]

ON THE IMPORTANCE AND DANGERS OF "REST IN PULMONARY CONSUMPTION."

By HORACE DOBELL, M.D.,

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HAD not Mr. Heather Bigg brought forward my name as the originator of "lung-splints" (JOURNAL, November 1st, page 530), I should not have thought it necessary, after all that I wrote on the subject in 1866-7, to join in the discussion on the importance of "rest in pulmonary consumption," just now excited by the interesting paper of my friend Dr. Berkart.

My object in now writing is not to enter into the dispute on the question of priority, but to issue a caution to those experimenting, either with Dr. Berkart's bandages or with my "lung-splints," lest anyone should think he has my authority for running into dangers which I have been most careful to avoid.

It was in November, 1872, that, at my request, Mr. Bigg made the first "lung-splint," and I asked him to call it at once by this name, as conveying an unmistakable explanation of its objects. He arranged it with his usual skill; it answered admirably, and he has made many others since, adapting each to the special requirements of the case. Before this, I had been accustomed to procure rest for portions of lung by other devices, principally by keeping the arm of the affected side flexed upon the walls of the chest, so as to restrain expansion by its weight and by the absence of muscular action, and it was the difficulty of sufficiently localising the pressure by these means to suit special cases that led me to suggest the "lung-splint;" but, whether it be partial rest of the whole of one lung, or more complete rest of a portion of one or both lungs that is desired, the greatest caution is necessary; because whatever local means secure rest to one part of the lungs, throw extra work upon the other parts, and may, therefore, easily do more harm than good.

For this reason, I have always used the greatest circumspection in selecting cases for this kind of treatment, and I trust that, if anyone is led to follow my example in one part of this treatment, he will most scrupulously do so in the other. With this precaution, nothing can be more satisfactory or more common sense, in the treatment of lung-disease, than the use of lung-splints, bandages, and the like; whereas without it nothing can be more foolish.

The "importance of rest in pulmonary consumption" was a necessary corollary upon my well-known hypothesis as to the nature and cause of

tuberculosis, viz., that tuberculation is peroxidation of albuminoid tissue; and, in my work on that subject published in 1866, and in my "Lectures on the True First Stage of Consumption," published in 1867, I brought this prominently forward. In enumerating the means of carrying out the "second principle of treatment in advanced tuberculosis, viz., to save the albuminoid tissues from disintegration to the greatest possible extent," I said, "By reducing respiratory action to the lowest point consistent with maintaining what remains of appetite and digestive power" (*Tuberculosis*, 2nd edit., page 45); and again (page 47), "Until this point is arrived at—until the balance is turned in favour of the albuminoid tissues—everything which favours the reception of oxygen into the blood, everything which increases the wear and tear of the body, everything which calls for the generation of animal heat, directly favours tuberculation, and precipitates the patient into the very catastrophe we wish to avert."

When discussing the views of Dr. Pollock and of Dr. Edward Smith (*True First Stage*, pp. 70, 71), I said, "It will be seen how entirely I disagree with Dr. Pollock in his interpretation of the phenomena which he has so carefully observed. While fully admitting and appreciating the conservative action of the organism in disease, I fail to see an example of it in the wasting of consumption, which appears to me to be the unavoidable effect of an arrest of the supply of an essential material for combustion and for histogenesis—an arrest in the supply of that for which it is impossible to stop the demand while life continues. On the other hand, I can see an example of conservative action in the attempt instinctively made by the patient to stop this demand by lessening respiration, abstaining from exertion, and seeking artificial heat—phenomena which Dr. Edward Smith interprets so differently. While fully admitting with Dr. Smith that, in early phthisis, respiration is diminished, I believe that he is totally wrong in his interpretation of its meaning. It is a law of animal nature to save a tender part, and I see, in the attempt at lessened respiration in early phthisis, an example of the operation of this law. The blood in the pulmonary circulation is deficient in the materials which the inhaled air seeks, the delicate tissue of the lungs is exposed to injury by the air, through deficiency in its usual protection of fatty blood, and nature comes to the rescue by attempting to diminish the quantity of air that is brought into the unprotected lungs, just as she shuts off the access of light from an inflamed retina by closing the iris or the eyelid." In referring to climatic treatment, I said (*True First Stage*, page 50), "The second object of climatic treatment—economy of fat and carbon in the organism, and protection of the lungs from undue oxidation, i.e., provisional protection against tuberculation—is of the greatest importance. . . . We must look for an atmosphere sufficiently warm to save some of the demand for carbon to supply animal heat, and we must look for a place where this warm diluted air can be breathed with as little exercise as possible." I recapitulate these statements, because it has been under the dictation of the principles to which they refer that I have been accustomed to prescribe rest in pulmonary consumption, whenever tuberculation has commenced or is already imminent. First, rest of the whole body; secondly, rest of the whole of both lungs; thirdly, rest of one lung; fourthly, localised rest of diseased portions of lung.

Those who enter into my views as to the importance of avoiding peroxidation of lung-tissue in consumption, will at once see how dangerous may be the effect of throwing exaggerated action upon one portion of lung by the attempt to control the action of another portion. If the disease by which the one portion was damaged had been purely local, there would be no danger worth considering in taxing the sound parts to save the unsound; but, when we consider consumption as "an abnormal physiological state" of the constitution, exposing all parts of the lungs to destructive changes, we at once see how much caution is required in determining that it is safe to throw exaggerated action on parts which may be only needing this excitement to subject them to the same destructive changes as those taking place in the portion of lung we wish to save by localised rest.

The rules for the cautious application of localised rest in lung-disease which I recommend, as dictated by a consideration of the nature of tuberculosis, and justified by the results of my own practice, are as follows.

1. If one lung, or a portion of one lung, or a portion of each lung, has become diseased, under circumstances which make it certain that there is no constitutional cause of lung-disease, then it is safe to secure localised rest for the diseased part, and to throw the extra work upon the sound parts; but even then it is necessary to be cautious that the extent of lung so rested is not too large in proportion to the extent of sound lung upon which the extra work is thrown. If there is any question about this, rest of the whole body must be secured in addition to the localised rest of lung, so as to save the sound lung from as much work as possible.

editions, Churchill has, by the addition of the words "until the head passes through the os uteri", corrected his former error and made a good statement, which for practical purposes is as near the truth and as useful as any other.

* *Manuel des Accouchés*, 1846, tome ii, p. 238.