limb. 5. *Gangrene below or beyond the seat of arterial obstruction.* Several interesting cases are recorded in which gangrene has followed arterial obstruction. Generally speaking, gangrene will not follow occlusion of the main arterial trunk of an extremity, as the collateral circulation soon becomes sufficiently developed to maintain its vitality. In many of the cases either thrombi have obstructed the channels of collateral circulation as well, or the veins of the limb have also been blocked up. When such extensive obstructions occur, they obviously cannot be embolic, but must depend on a local thrombosis, traceable to some general blood dyscrasia depending on the puerperal state.

Treatment.—Little can be said as to the treatment of such cases, which must vary with the gravity and nature of the symptoms in each. Beyond absolute rest (in the hope of eventual absorption of the thrombus or embolus), generous diet, attention to the general health of the patient, and sedative applications to relieve the local pain, there is little in our power. Should gangrene of an extremity supervene in a puerperal patient, the case must necessarily be well-nigh hopeless. Simpson, however, records one instance in which amputation was performed above the line of demarcation, the patient eventually recovering.

CHAPTER VIII.

OTHER CAUSES OF SUDDEN DEATH DURING LABOR AND THE PUERPERAL STATE.

A LARGE number of the cases in which sudden death occurs during or after delivery find their explanation, as I have already pointed out, in thrombosis or embolism of the heart and pulmonary arteries. Probably many cases of the so-called *idiopathic asphyxia* were, in fact, examples of this accident, the true nature of which had been misunderstood. Besides these, there are, no doubt, many other conditions which may lead to a suddenly fatal result in connection with parturition.

Some of these are of an organic, others of a functional nature.

Organic Causes.—Among the former may be mentioned cases in which the straining efforts of the second stage of labor have produced death in patients suffering from some pre-existent disease of the heart. Rupture of that organ has probably occurred from fatty degeneration of its walls. Dehous[1] narrates an instance in which the efforts of labor caused the rupture of an aneurism. Another case, from interference with the action of the heart in a patient who had pericardial effusion, is narrated by Ramsbotham. Dr. Devilliers relates an

[1] Dehous: Sur les Morts subites.

instance occurring in a young woman during the second stage of labor. The heart was found to be healthy, but the lungs were intensely congested and blood was extensively extravasated all through their texture. This was probably caused by pulmonary congestion and apoplexy, produced by the severe straining efforts. Many cases from effusion of blood into the brain substance, or on its surface, are on record—no doubt in patients who, from arterial degeneration or other causes, were predisposed to apoplectic effusions. The so-called apoplectic convulsions, formerly described in most works on obstetrics as a variety of puerperal convulsions, are evidently nothing more than apoplexy coming on during or after labor. As regards their pathology, they do not seem to differ from ordinary cases of apoplexy in the non-pregnant condition. One example is recorded of death which was attributed to rupture of the diaphragm from excessive action in the second stage.

Functional Causes.—Among the causes of death which cannot be traced to some distinct organic lesion may be classed cases of syncope, shock, and exhaustion. Many instances of this kind are recorded. Thus in some women of susceptible nervous organization the severity of the suffering appears to bring on a condition similar to that produced by excessive shock or exhaustion, which has not unfrequently proved fatal. Several examples of this kind have been cited by McClintock.[1] It is also not unlikely that sudden syncope sometimes produces a fatal result during or after labor. Most cases of death otherwise inexplicable used to be referred to this cause; but accurate autopsies were seldom made, and even when they were—the important effects of pulmonary coagula being unknown—it is more than probable that the true cause of death was overlooked. It has been supposed that the sudden removal of pressure from the veins of the abdomen, by the emptying of the gravid uterus after delivery, may favor an increased afflux of blood into the lower parts of the body, and thus tend to an anæmic condition of the brain and the production of syncope. However this may be, the possibility of its occurrence, and its manifest danger in a recently delivered woman, are sufficient reasons for enforcing the recumbent position after labor is over. In some of the cases the syncope was evidently produced by the patient suddenly sitting upright.

Death from Air in the Veins.—Some cases of sudden death immediately after labor seem to be due to the entrance of air into the veins. Six examples are cited by McClintock which were probably due to this cause. La Chapelle related two. An interesting case is related by M. Lionet.[2] In this the patient died five and a half hours after an easy and natural labor, the chief symptoms being extreme pallor, efforts at vomiting, and dyspnœa. Air was found in the heart and in the arachnoid veins. There can be no question that the uterine sinuses after delivery are nearly as well adapted as the veins of the neck for allowing the entrance of air. They are firmly attached to the muscular walls of the uterus, so that they gape open when that

[1] Union Méd., 1853.

[2] Dehous: op. cit., p. 58.

organ is relaxed, and it is easy to understand how air might enter. Indeed, in the post-mortem examination in one of the cases occurring in the practice of Mme. La Chapelle, it is stated that "the uterine sinuses opened in the interior of the uterus by large orifices (one line and a half in diameter), through which air could readily be blown as far as the iliac veins, and *vice versâ*." The condition of the uterus after delivery also enables the air to have ready access to the mouths of the sinuses, for the alternate relaxation and contraction of the uterus, occurring after the placenta is expelled, would tend to draw in the air as by a suction-pump. Hence an additional reason for insisting on firm contraction of the uterus, as this will lessen the risk of this accident.

The precise mechanism of death from air in the veins has been a subject of dispute among pathologists. By Bichat[1] it was referred to anæmia and syncope for want of blood in the vessels of the brain, which are occupied by air. Nysten[2] attributed it to distention of the cavities of the heart by rarefied air, producing paralysis of its wall; Leroy, to a stoppage of the pulmonary circulation and consequent want of proper blood-supply to the left heart; while Leroy d'Etoilles thought it might depend on any of these causes or a combination of all of them. These, and many other hypotheses on the subject, have been advanced, to all of which serious objection could be raised. The most recent theory is one maintained by Virchow and Oppolzer,[3] and more recently by Feltz, which attributes the fatal results to impaction of the air-globules in the lesser divisions of the pulmonary arteries, where they form gaseous emboli, and cause death exactly in the same way as when the obstruction depends on a fibrinous embolus. The symptoms observed in fatal cases closely correspond to those of pulmonary obstruction, and it is not unlikely that some cases attributed to other causes, may really depend on the entrance of air through the uterine sinuses. Such, for example, was most probably the explanation of a case referred to by Dr. Graily Hewitt in a discussion at the Obstetrical Society.[4] Death occurred shortly after the removal of an adherent placenta, during which, no doubt, air could readily enter the uterine cavity. The symptoms, viz., "severe pain in the cardiac region, distress as regards respiration, and pulselessness," are identical with those of pulmonary obstruction. Dr. Hewitt refers the death to shock, which certainly does not generally produce such phenomena.

1 Recherches sur la Vie et la Mort, 1853.
2 Recherches de Phys. et Chim. Path., 1811.
3 Kasuistik der Embolien; Wiener med. Wochenschr., 1862; Des Embolies capillaires, 1868; and op. cit., p. 115.
4 Obst. Trans., 1869, vol. x. p. 28.

CHAPTER IX.

PERIPHERAL VENOUS THROMBOSIS—(SYN.: CRURAL PHLEBITIS—PHLEGMASIA DOLENS—ANASARCA SEROSA—ŒDEMA LACTEUM—WHITE LEG, ETC.).

Peripheral Thrombosis.—We now come to discuss the symptoms and pathology of the conditions associated with the formation of thrombi in the peripheral venous system, or rather in the veins of the lower extremities, since too little is known of their occurrence in other parts to enable us to say anything on the subject.

The most important of these is the well-known disease which, under the name of *phlegmasia dolens*, has attracted much attention and given rise to numerous theories as to its nature and pathology. In describing it as a local manifestation of a general blood dyscrasia, and not as an essential local disease, I am making an assumption as to its pathology that many eminent authorities would not consider justifiable. I have, however, already stated some of the reasons for so doing, and I hope to show shortly that this view is not incompatible with the most probable explanation of the peculiar state of the affected limb.

Symptoms.—The first symptom which usually attracts attention is severe pain in some part of the limb that is about to be affected. The character of the pain varies in different cases. In some it is extremely acute, and is most felt in the neighborhood of, and along the course of, the chief venous trunks. It may begin in the groin or hip and extend downward; or it may commence in the calf and proceed upward toward the pelvis. The pain abates somewhat after swelling of the limb (which generally begins within twenty-four hours), but it is always a distressing symptom, and continues as long as the acute stage of the disease lasts. The restlessness, want of sleep, and suffering which it produces are sometimes excessive. Coincident with the pain, and sometimes preceding it, more or less *malaise* is experienced. The patient may for a day or two be restless, irritable, and out of sorts, without any very definite cause; or the disease may be ushered in by a distinct rigor. Generally there is constitutional disturbance, varying with the intensity of the case. The pulse is rapid and weak, 120 or thereabouts; the temperature elevated from 101° to 102°, with an evening exacerbation. The patient is thirsty; the tongue is glazed or white and loaded; the bowels constipated. In some few cases, when the local affection is slight, none of these constitutional symptoms are observed.

Condition of the Affected Limb.—The characteristic swelling rapidly follows the commencement of the symptoms. It generally begins in the groin, whence it extends downward. It may be limited