is given. In some instances the local weakness may be due to an injury bruising or lacerating the vessel and injuring its internal coat. When an artery is wounded and when the wound in the skin and superficial structures heals, the blood may escape into the tissues. In this case it displaces the tissues and by its pressure causes them to condense and form the sac-wall. The coats of the vessels, more especially when they are diseased, may be torn from a severe strain, and the blood will then escape into the condensed tissues forming the sac-wall. When one or more of the vessel coats form the sac there results what is called a *true aneurism* ; in those in­stances in which the sac-wall is formed by the condensed tissues around we have a *primary false aneurism* ; when a true aneurism bursts and the blood escapes into the tissues around it, as sometimes occurs in deep-seated aneurisms, giving rise to secondary localized accumulation, the term *secondary false aneurism* is used. In both varieties of false aneurism the swelling is more diffuse and the pulsation as a rule is less marked than in the true aneurism.

The blood in an aneurism is at first in a fluid state, and at each beat of the heart a certain amount passes into the sac, causing its ex­pansion. In all aneurisms there is a tendency to coagulation of the blood, and a blood-clot is deposited in a laminar form on the inner surface of the aneurismal sac. In some instances this laminar coagulation by constant additions gradually fills the aneurismal cavity. The pulsation in the sac then ceases ; contraction of the sac and its contents gradually takes place ; the aneurism is cured. On the other hand, if the blood within the sac remains fluid, the aneurism will gradually increase in size ; the tissues over the aneurism and the sac-wall will become thinned, and at last give way ; and death occurs from hæmorrhage.

In the treatment of true aneurism the great principle is to encour­age coagulation in the aneurismal sac. This can be done by lessening the force of the circulation generally or locally. The general force of the circulation can be lessened by low diet, rest in bed, avoid­ance of all causes of vascular excitement, and by the administration of large doses of iodide of potassium. The force of the circulation can be decreased locally and temporarily by the application of a ligature to the artery between the aneurism and the heart or by the application of pressure upon the main vessel at a convenient point between the aneurism and the heart. The general treatment is available in all cases. The local treatment by operation or by compression is only available in those instances in which the aneurism is so situated that the blood-vessel can be compressed or ligatured, as in aneurisms of the head and neck or of the extre­mities. In certain aneurisms in the lower part of the neck and upper part of the thorax, in which a ligature cannot be applied between the aneurism and the heart, the blood-flow through the aneurismal sac has been diminished by the application of a ligature to one or more of the main vessels on the distal side of the aneur­ism. The blood-supply to the parts beyond the aneurism being thus cut off, the immediate effect is increased pressure on the aneur­ismal sac ; but, since the parts accommodate themselves to altered circumstances, as the collateral blood-vessels increase in size, be­coming the main vessels of supply to the parts beyond, the original channel becomes of secondary importance, the result being a diminu­tion in the size of the main vessel and diminished blood in the sac, encouraging coagulation and contraction of the aneurismal sac. Practically the same effect has sometimes been obtained in a per­manent way, as in cases of rapidly increasing aneurism of the sub­clavian artery in the root of the neck by amputation of the upper extremity at the shoulder joint. And within the last few years, in popliteal aneurism, the same thing has been done temporarily by the application of an elastic bandage to the limb from the foot upwards to the popliteal space, emptying the blood-vessels below the knee, and in this way cutting off the blood-supply tempo­rarily. The application of the elastic bandage is continued up the thigh, care being taken not to make firm pressure with the bandage as it passes over the aneurism behind the knee joint, so that the sac may not be emptied of blood. If the sac were emptied, the object in view would be defeated, because there would be no blood in the sac to coagulate. The continuation of the bandage in the thigh above the aneurism is practically a compressing agent applied to the artery on the proximal side of the aneurism. The rationale of this treatment of popliteal aneurism, due to Dr Walter Reid of the British navy, may, if this explanation is correct, be said to owe its success to the fact that in it we combine the two great principles which check the blood-pressure locally, *i.e.,* a cutting off of the blood-supply beyond the aneurismal sac and compression on the main vessel on the proximal side. It is to be noted that all these different means of checking the blood-pressure within the aneurismal sac are temporary in their action. The temporary arrest by compression, the equally temporary arrest by the application of a ligature, in the latter case the collateral anastomosing circulation taking the place of that of the main trunk which has been ligatured, start the process of coagulation within the sac, and, the process being once started, complete consolidation gradually takes place. Although these methods of treatment are principally of value in true aneurism, they are also to a certain extent useful in secondary

false aneurism. In primary false aneurisms, on the other hand, we have to deal with a wounded vessel in which the blood, instead of being poured out externally, is poured into the tissues, and is practically a (chronic) bleeding point ; the principle of treatment is to open the sac, turn out the clots, aud ligature the artery above and below the bleeding point.

The veins are liable to inflammation *(phlebitis).* When this occurs the blood in the vein is liable to coagulation, forming a clot or thrombus, which, if displaced from its original position, either makes its way as an embolus towards the heart and is there arrested, or passes through the cavities of the heart into the lungs, there sticking and giving rise to lung symptoms. If the thrombus is formed in the hæmorrhoidal plexus, it passes as an embolus by the portal system into the liver. If it is formed in the left side of the heart, it may pass into the large vessels at the root of the neck and reach the brain, giving rise to symptoms of brain disease. The thrombus may be formed apart from inflammation of the vein wall in consequence of diseased states of the blood, as in gout and rheumatism, or it may form in consequence of stagnation of the blood-current due to slowing of the circulation in various wasting diseases. When a thrombus forms, absolute rest in the recumbent posture is to be strictly enjoined ; the great danger is embolism or the displacement of the clot from its original position. Hot fomentations in the early stages and belladonna ointment when the condition becomes sub-acute are the best local applications. The desire is to promote absorption of the clot. The veins in the lower extremity and in the hæmorrhoidal and spermatic plexus are liable to dilatation. The condition is termed *varix.* The veins dilate with tortuosity ; the valves become incompetent ; and the condition is apt to spread. In the lower extremity the primary cause may be an injury or some obstruction at a higher point. General laxity of the tissues predisposes to the condition ; occupa­tions which necessitate much standing and alternation of heat aud cold also act as predisposing causes. The treatment consists in giving the dilated vessel support by means of an elastic bandage or stocking. When the condition is local and gives discomfort, the vessel may be ligatured at various points so as to cause its oblitera­tion. This operation should not be undertaken rashly, and should only be performed if the case is an aggravated one, since it is by no means devoid of risk. In the hæmorrhoidal plexus the disease is termed *internal hæmorrhoids* or *piles* ; many operations are per­formed for this condition, but in the great majority of cases the careful use of purgatives and the administration of cold water in­jections into the rectum will relieve the condition. The dilated veins often ulcerate and give rise to bleeding piles ; here an opera­tion is often called for, because the persistent loss of even small quantities of blood is apt to result in chronic anæmia. The enlargement of the spermatic plexus is termed *varicocele,* and almost always occurs on the left side. The use of a suspensory bandage and cold bathing should first be tried ; if the disease persists, it is often associated with mental depression, and an operation—ligature at several points of the dilated vessel—should be performed. The disease may be associated with atrophy of the testicle on the same side, and this liability aggravates the mental condition and en­courages the surgeon to operate. Inflammation of the lymphatic vessels in the lower limbs is often associated with inflammation of the veins in the female after delivery, giving rise to the various forms of *white leg.* Acute inflammation of the lymphatic vessels and glands is also associated with poisoned wounds, and has al­ready been alluded to in connexion with injuries. The use of hot fomentations and careful elastic pressure with rest are prescribed for treatment.

2. *Diseases of Bone.*

Attention has already been directed to one form of injury to a bone, viz., fracture. A word may now be said about inflammation of a bone and its results. As a typical instance we will take a long bone, consisting of a shaft and two extremities. The walls of the shaft consist of dense bone, the extremities of cancellated tissue. The shaft of the bone is hollow, and filled with medullary tissue. In the fully developed bone the extremities alone are tipped with cartilage ; in the extremities of the bones of a growing person there are also layers, termed the *epiphyseal cartilages.* The bone is surrounded by a fibrous membrane termed the *periosteum.* This membrane is richly supplied with blood-vessels, which ramify through it and pass, along with lymphatic vessels and nerves, from it into the Haversian canals in the dense bone forming the shaft. The deeper layers of the periosteum consist of osteoblastic cells, which also line the Haversian canals. In the undeveloped condition these cell elements take an active part in the growth of the bone as regards its breadth, the epiphyseal cartilages taking an active part in its growth as regards its length. The medullary tissue in the cavity of the bone is supplied by the nutrient artery ; the cancellated tissue forming the extremities receives its blood-supply partly from the nutrient artery and partly from vessels passing in­directly from the periosteum. When a bone is injured—as happens, for example, in a severe bruise—the blood-vessels in the periosteum and in the Haversian canals become congested, effusion of liquor