

grief or exposure. Many thousand people smoke a pipe and do not get cancer, because they do not have the diathesis. As a result of the irritant, the cells proliferate and there is produced a chemical substance called toxin. This increases the irritation on the inside and causes the proliferation to continue. The cells do not accumulate on the surface, but infiltrate into the subcutaneous tissue, muscles and periosteum. These cells proliferate wherever the germs exist to irritate them. Remember, then, that in a corn the irritant comes from without, while in epithelioma the irritant is a germ which acts from within. So much for epithelioma, and this leaves out of consideration a whole class of tumors in which the process is identical, whether on the surface of the skin or beneath it. Laying this aside, let us consider that character of growths presented by fibrous tissue, which includes all fibromata, sarcomata and scirrhus cancers.

The processes of nature are blind, and she acts just as she is forced to act. When we have an amputation, the large flaps are open and a dreadful gap has been made. The surgeon cleanses the wound, renders it aseptic, sews it up and trusts to nature to cure it. All the elements that are concerned in cancer are brought to bear here, and grow and heal the wound. The element that nature puts into a malignant cancer she puts into the process of healing wounds. In a cut or wound, as a result, a clot forms in the mouth of the vessels and checks hæmorrhage. The blood is still being forced into the vessels, and in these vessels are small mouths or stomata against which a white blood cell fits. The cells enter into the stomata and, by an hour-glass contraction, escape from the vessels as leucocytes, giving us the phenomenon of diapedesis. The leucocytes are destined by nature to grow into fibrous tissue by their elongation. When millions of these leucocytes are exuded into the wound, we say it is covered with healthy granulations. These soon fill the wound, and it is found that those which fill the bottom of the wound have become fibrous; above this come the spindle-shaped and on top the round cells. Finally, all that remains to complete the healing is to cover it with epithelium. If, for some reason, the leucocyte had not grown, but had been killed, it would have undergone fatty degeneration and given us a pus cell. You must retain these steps and follow them closely if you wish to get an accurate notion of the development of cancer.

You will find nothing but fibrous and epithelial tissues in cancer, but they are arranged differently from the normal tissues of the body. Sarcoma is a variety of fibroma. Just as epithelioma is a variety due to the growth of epithelial cells, fibroma is due to the growth of fibrous cells. In fibroma there is an exudation of cells from a vessel, which undergo the same changes that they do in

the healing of an ordinary wound. If you make sections of a fibroma and examine them with a microscope, you will find cells of different ages, representing the round, spindle and fibrous cell, all in the same tumor. When you find the fibrous cells in excess, it is a fibroma; when the spindle cells predominate, it is a spindle-cell sarcoma; and if the round cells are in excess, it is a round cell sarcoma. A fibroma and a sarcoma are really the same thing, but the sarcoma grows much more rapidly than the fibroma. A fibroma cannot become a fibroma until it has undergone the same process of growth as a sarcoma, only much more slowly.

The carcinoma develops either as the soft encephaloid or hard scirrhus in the glands. Just as we have the epithelioma on the surface, we may have a growth of endothelial cells in a gland, giving us the encephaloid (brain-like) cancer. When the mass is simply composed of endothelial cells with a very small amount of fibrous tissues and without structure, it is the encephaloid. A scirrhus is nothing else than a combination of the encephaloid and fibrous tissue in which the fibrous tissue predominates. It is much harder than the encephaloid, but the process of development is the same. The epithelial cells are inclosed within fibrous cells, forming alveoli.

We next come to consider the mucoid and amyloid cancers. Nature can do nothing more than I have stated, and these cells, growing under abnormal circumstances, die and, being contracted upon by the fibrous tissue, undergo amyloid, mucoid, or calcareous degeneration, giving us these forms of cancer.

*Metastasis.*—To my mind the very best proof of malignant growths being due to a micro-organism is the element of metastasis—that element by which a growth, if not properly removed, will break out anew in the same or another place, as only one germ is required to develop it. A tumor may be thoroughly removed, but, if a neighboring gland be affected, what can be plainer than that the poison has travelled along the lymphatics and developed? Here is an idea I wish to submit to you that will take away any absolute or stereotyped rule, and that is, when to pronounce a growth benign and when malignant. Why call the one growth benign and the other malignant?

The thickened epidermis on the hand is benign because the irritant that produced it was outside of the body and can be removed. The epithelioma is malignant because it returns; the irritant in the tissue has not been completely removed. There is one more growth and that is the lymphoma. A lymphoma is nothing more than a fibroma in some of whose cells are deposited fat globules. The oil in the cell has simply pushed the nucleus to one side. A fibrous cell does not possess the power of infiltration like the epithelial, and is self-limiting.