

blood is an increase in the watery elements, and diminution of the fibrine. It contains much serum, forms no or only very small coagula, and is of a very dark color. Another peculiarity presented by the blood is the increase of fat.

*Fatty Tissue:* There is a marked increase in the subcutaneous fat, in the fat between the muscles about the different organs, especially heart, kidneys, intestine, in the greater and lesser omenta, in the mesentery, etc. In the latter stages of alcoholism, when the digestion becomes impaired and the blood deteriorated, this accumulation of fat disappears. According to Rokitsky there is an increase of fat in the marrow of the bones, the bony tissue at the same time being atrophied.

*The Stomach and Intestine:* A Chronic Catarrhal condition of the stomach is quite constant, and appears early in the disease. This is indicated by abundant soft gray mucus, projections of the mucous membrane, and by the slaty color that occurs, especially near the pylorus. Owing to the disturbance of circulation which takes place later in other organs the return of the blood from the stomach is interfered with so that a varicose condition of some of the veins is produced. The hypertrophy is very apt to be accompanied by dilatation of the glands, due to compression at their outlet, so that small cysts which are filled with a clear fluid and project from the surface result. The continued irritation of the diseased mucous membrane is productive of a variety of ulcerations from the small hemorrhagic erosion, characterized by a superficial loss of substance, to the so-called round or perforating ulcer.

*The Liver:* The liver is the first and most severely affected by the abuse of alcohol of any organ in the body. The alcohol being taken up by the portal system is carried directly to this organ and there, by its irritating effect, produces various disorders according to the individual's condition, and more especially the character of the alcohol. The more concentrated the alcohol the sooner and the more severely is the liver affected. Among the causes of fatty liver the abuse of alcohol is one of the most prominent. It is probable the alcohol acts by retarding the metamorphosis of tissue, and the blood being overcharged with fat deposits it rests in this organ.

*Interstitial Hepatitis—Cirrhosis of the Liver:* The most common cause of this form of interstitial hepatitis, which extends uniformly over the whole organ, is usually considered to be the intemperate use of alcohol—still this is not necessary; most drunkards do not have a cirrhotic, but a fatty liver, and many persons with cirrhosis are not in the habit of dram-drinking.

*Organs of Respiration:* Drunkards are very subject to catarrh of the larynx, which is often accompanied by a similar condition of the pharynx. This catarrhal inflammation of the larynx not unfre-

quently extends into the bronchi. A very important question is whether the habitual use of alcohol predisposes to disease of the lungs.

*The Heart:* In habitual drunkards the heart is almost always found hypertrophied. This hypertrophy may be brought about in many ways. As is well known, the effect and force of alcohol is to increase the frequency and force of the pulse. When a muscle is called upon to do an extra amount of work the effect is to increase the size of that muscle.

*The Vessels:* The change in the capillaries consists in an increase in their lumen, that of the smaller and larger arteries in the so-called atheromatous degeneration. The dilatation of the small vessels and hyperemia of all the organs have been explained on the ground that alcohol has a paralyzing effect upon the vaso-motor system; also, that the alcohol by its irritating effect upon the walls of the vessels, causes a fatty degeneration of the same, and as a consequence a loss of tonicity.

*Affections of the Urinary Organs:* After each ingestion of alcohol the secretion of urine is increased as a large quantity of water is excreted with it. The diseases of the kidneys which most frequently occur in drunkards, and especially in the latter stages of alcoholism, are the parenchymatous and interstitial or granular nephritis. This latter is divided into two stages, that of infiltration of cellular elements, and the other of connective tissue formation. At first the inflammatory process produces an active hyperemia, with an exudation of fluid and white blood corpuscles into the interstitial connective tissue. This in turn is productive of anemia, impaired nutrition of the renal epithelium, and granular degeneration of the same.

*The Nervous System:* The affections of the nervous system in drunkards are both numerous and important. No organ, with exception, perhaps, of the liver, suffers so constantly and from such a variety of lesions as the central nervous system. Many alterations in the functions are recognizable after death by a change in the tissues, but there are various affections on the other hand, which point to a marked change in the cerebro-spinal system that cannot be detected.

*The Brain:* The calvarium is altered. It is increased in weight by hyperostosis and sclerosis, both the outer and inner table being thickened. The cancellated structure is more dense, owing to a concentric formation of bone about the Haversian canals. Upon the inner surface the channels of the vessels are deeper than normal as well as the depressions for the Pacchionian bodies. There is an increase in the amount of blood in the brain owing to the abnormal action of the heart and fatty or an atheromatous degeneration of the walls of the small vessels, or diminished nutrition of the same, which paralyzes them so that their lumen becomes increased and hyperemia results.