

The difference in the two states is chiefly accounted for by the slowness of onset in the senile disease as compared with the quicker process in the diffuse form. In the former the atrophy of tissue is also greater.

The chief cause of arterial degeneration in advanced life is the natural decay of tissues. In the diffuse form the primary event is a degeneration of the media of the large and small arteries. As to how this is brought about, opinions differ. There can be no question that the resisting power of the arterial tissues varies much in different persons. In many people they are the weakest spot—the *locus minoris resistentie*. There is abundant proof that this proneness to early decay is frequently hereditary. As to the exciting causes of early decay the following may be mentioned: over-eating, the constant use of alcohol,—especially beer, excessive smoking, hard manual labor, athleticism, poisoning by lead or mercury, retention of uric acid (so-called gouty arteritis), the toxins of the various infectious diseases, etc.

In a recent paper in the *Journal of Pathology and Bacteriology* Hollis suggests that the entry of various micro-organisms played a leading part in inducing atheromatous changes.

I will first say a few words in regard to the abuse of alcohol in inducing hypertrophy of the heart, secondarily through producing arterio-sclerosis, and primarily without any arterial change whatever. In Germany, where beer is the favorite beverage, what is commonly known as the Munich beer-heart is very common. It is the form of heart lesion in more than 55.3 per cent. of all heart cases. It may exist with or without any arterio-sclerosis. In the great majority of cases, according to Mohr, it exists independently of any arterial changes. The fact that in countries where stronger alcoholic drinks are consumed than in Germany, renders it highly probable that the cardiac hypertrophy from the use of large quantities of beer is due, more to the filling of the vessels with fluid than from any direct action of the alcohol itself. The quantities consumed daily by every steady beer drinker in Germany amounts to three or four quarts—five, six and even seven quarts is the daily allowance of not a few.

"Four quarts of beer contains about eight ounces of hydrocarbons in solution, and therefore capable of complete absorption into the circulation."—Strunpell.

It is therefore easy to understand how the heart is over-burdened, especially when one considers that obesity is present as a rule in those who use beer so freely. In some cases it would seem that alcohol has a direct action in causing increased pressure in the vessels. Even allowing that alcohol may have no direct influence in bringing about the hypertrophy of the heart, it no doubt promotes the degenera-

tive changes in the heart muscle and cardiac nerves, which at least render the heart's action inadequate and the circulation imperfect.

The consumption of excessive quantities is generally found in those who eat to excess and who are engaged in severe toil—all causes which tend to induce cardiac hypertrophy. In indolent people we have obesity which is in some respects as injurious as excessive work.

The consumption of large quantities of food and beer gives rise also to a hyperæmia of the intestinal vessels, which greatly increases the pressure in the arteries. It is generally allowed the strong tea, coffee and tobacco have a direct action in causing increased pressure in the arterial system. They are all promoting causes of the cardiac changes. Seldom do we find anyone prominent. Practically we nearly always find over-eating, drinking, smoking, the excessive use of tea or coffee, together. Nicotine in the lower animals causes a great fall of blood pressure, but from this we are not to conclude that the continuous use has not an opposite action on man, as has been done.

The course of this hypertrophy varies considerably. In the great majority of cases it is found that the increased power is sufficient for a lengthened period to carry on the circulation compatible with a fair degree of health, but in not a few cases, especially in excessive beer consumers, an acute heart failure sets in, which rapidly proves fatal; this often happens without any degenerative changes in the heart muscles. Bauer has reported a number of cases where heart failure has set in a very short time after the hypertrophy developed, and in which fatal result followed—a veritable heart paralysis, as he calls it. In the majority of cases, if the cause is not removed, gradual degenerative changes go on in the heart muscle, which finally lead to general dropsy.

Another important cause of cardiac hypertrophy is over-work, leading to strain of the heart muscle. Both ventricles are usually involved, and dilatation and hypertrophy are always found together. It is met with in those whose work entails severe muscular efforts. On superficial examination, such patients usually present a very healthy appearance. On physical examination, however, the chest is found to be barrel-shaped, and the second sound, both aortic and pulmonic, is accentuated. It has been met with in soldiers, especially during active service in the field. DaCosta, Frantzel and many others have contributed valuable papers on this particular form of heart strain. It does not differ, however, in any respect from that met with from other forms of over-work.

In a recent paper on cycling, B. Ward Richardson points out that the ultimate action of excessive cycling is to increase the size of the heart, to render it irritable and hypersensi-