

Eberth's observations, so that at the present time the bacillus typhosis is generally concluded to be the essential if not the sole agent in causing this disease.

This germ is found principally in the lymphoid structures of the body, more especially in the agminated and solitary glands of the intestine, the spleen and mesenteric glands, but it has been found in the blood and various tissues of the body. It accounts for many of the complications and sequelæ of typhoid and may exist in isolated spots in the tissues for years after the fever is over. This fact is proven by a case published in the annals of the Pasteur Institute, where osteomyelitis of the femur existed for six years and pure cultures of the bacillus typhosis were found at the end of this time.

The germ, although constant in typhoid fever, has not induced the disease experimentally in animals, probably from their immunity. It will flourish in water and milk, whether oxygen be excluded or not. It is killed by gastric juice, but not by pepsine, bile or pancreatic juice. Chantemesse and Widal state that it will thrive on gelatine containing 2 in 1,000 acid carbolic, while most other organisms will perish.

The pathology and morbid anatomy of typhoid fever have been well worked out in recent years. The solitary and agminated glands become swollen and engorged, and as the disease progresses, in eight or ten days, the follicles become fungating masses, the columnar epithelium disappears and an increase takes place in the lymphoid and interstitial connective tissue. Part, more rarely the whole, of the gland is removed by ulceration and sloughing, down to the muscular coat.

The serous coat is swollen and its blood vessels and lymphatics markedly dilated. Occasionally the ulceration extends through all the coats. Ulceration has been found throughout the whole length of the intestine. In the Peyer's patches the ulcers are lengthwise of the bowel and heal with very small scars. In the colon, where they result from ulceration of the solitary glands, the ulcers are small and round but may run together and then form an ulcer generally transverse of the gut. The healing of these ulcers progresses during convalescence, each ulcerated patch requiring about two weeks for healing. In aborted cases the changes are said to stop in the stage of engagement.

The bowel contents consist of large quantities of bile pigment, epithelial cells, leucocytes, crystals of trip. phosphate fungi in abundance with perhaps undigested matters. The spleen, being a lymphoid structure, is enlarged early to two or three times its normal size, especially in young subjects. It is soft and friable and dark in color. The enlargement is said to be due to vascular engorgement and inhibition of the normal contraction of the muscular fibres of the capsule and trabeculæ.