

contents are perhaps most alkaline. This region is, therefore, most favorable to bacterial growth. Multiplication occurs with extreme rapidity, so that the intestinal contents in a few days teem with countless numbers of fungi. They are, however, by no means confined to the intestine, but are conveyed by the absorbents into the follicles in the intestinal wall, and through the radicals of the portal veins to the liver, and so on through the system generally. They may be found in the solid viscera, tissues, and fluids throughout the entire body. That the main culture is, however, in the intestine is borne out by the fact that immense numbers are in the evacuations, and that infection is universally attributed to unsterilized fecal matter. Keeping pace exactly with this process in the bacillus is the production and accumulation of a chemical substance—a bi-product, which is a necessary element in the vital activity of the bacillus. By separating this substance from cultures, and experimenting with it, many of its properties have been determined by Brieger, Novy, Sims-Woodhead, and others. It was found to produce local, as well as what may be called constitutional, effects. Sims-Woodhead likens it, acting locally, to a "caustic." Its first and mildest effect is to stimulate the cells of the parts, causing them to become swollen, and to increase in their rate of multiplication. If, however, the toxine is allowed to remain long in contact with the cells, or if it is in sufficiently concentrated form, instead of irritation and increased activity, the cells lose their vitality and necrosis takes place. As examples of its constitutional effect, we may instance fever, delirium, tremor, lethargy, or its mydriatic action on the pupil. If a large dose be given to an animal, it speedily dies narcotized; if a somewhat smaller dose be given, and repeated for a time, the animal gradually merges into coma, and shortly dies. The toxine is, in fact, the weapon of the bacillus, without which it would be a harmless particle of vegetable protoplasm.

The symptoms generally are determined by the amount of poison in the body, and, in the case of different individuals, by a varying degree of susceptibility, or a varying degree of virulence in the poison itself. The local disturbance is determined by the quantity of the poison in contact with the tissues, to its degree of concentration, and to the length of time it remains in contact. It is by noting these facts regarding the toxine that one gets the key to the situation. Look, for example, at the case of the intestinal follicles; why is it that the tissues here suffer to such an extreme degree? Surely not from any selective action of the bacteria, but rather from the fact that the follicles are in close proximity to the main culture, and are surrounded by lymph sinuses into which empty the lacteal ducts of the surrounding villi. Each follicle is, in fact, the reservoir to which is conveyed both poison and bacteria absorbed from the intestine. The bacteria and poison carried to other parts of the body produce, in a minor