

beaker or bottle, we observe that in a few moments the whole mass becomes of a jelly-like or semi-solid consistence. That is, the blood has clotted, or undergone coagulation. By and by we observe that the clot seems to be squeezing out of itself some drops of yellowish or straw-colored fluid. The contraction continues until the clot appears to be surrounded by a layer of this fluid, which is called the "serum" of the blood, to distinguish it from the cellular elements, *i.e.*, the red and white blood corpuscles which are contained in the clot.

Again, it may not be known to all of you that the minute vegetable germs of which I have spoken are, with few exceptions, much less harmful in themselves than are the products to which they give rise during the activity of their lives. These products are to a large extent due to decomposition of the tissues in which the germs lodge, and are the "toxines" or virulent poisons which exert such a depressing effect upon the vital functions of those attacked by disease. Whether formed originally in the blood or in a local inflammatory or diseased area, such as the abscess, and thence absorbed into the circulation, these toxines are ultimately found to be held in solution in the serum of the blood. If produced in sufficient quantity, and not overcome or eliminated by nature's own powers of resistance, they must, of course, in the absence of treatment, produce death. That is the disease; let us now look at the means at hand for combating its baneful effects. From time immemorial the strongest ally the doctor has had is the *vis medicatrix naturæ*. But it is only now that we begin to have a glimmering of what this healing power of nature really is. We have very good reason to believe that immediately upon the absorption into the circulation of any of these toxines nature excites the cells and tissues of the body to produce some substance which will neutralize or counteract them. The substance so produced for this specific purpose is fitly called the "antitoxine," and it also has its residence in the blood serum. If the antitoxine can be produced with sufficient rapidity the toxines are overcome, and the antitoxine becomes the aggressor, attacking and finally routing and destroying the germs.

During the development of the antitoxines also the resisting powers of the cells and tissues seem to be increased, so that if a fresh crop of germs were implanted they would find the soil so hostile to their presence that the colony would soon die out. This is known as "immunity" to the disease.

Again, it has long been the custom of experimenters to grow the disease-producing germs artificially, outside the body, in such media as gelatine and beef tea. These "cultures," as they are called, are found after the germs have been growing for some time to be rich in toxines, and by subjecting the whole contents of the culture-vessel to a process of filtration