

his class in rotation, about ten being admitted at one time. He does not make any point as to the time spent in this operation. Each patient was assigned a cottage, isolated and containing two rooms, one for the patient and one for the nurse. Before the operation these rooms were thoroughly scoured with a disinfectant solution and the patients were briskly rubbed all over with a solution of the bichloride, 1 to 1,000. The operator and his assistants used the same solution upon the arms and hands. No other disinfectants were used during the operations. One of these patients had been taking 96 grs. of sulph. morphia per week.

Of the operations of laparotomy at the N. Y. Woman's Hospital during 1883, there were 80 per cent. of recoveries, some of the fatal cases being desperate at the time of admission.

#### A NEW EXPLANATION OF THE PROCESS OF INFLAMMATION.

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In the last number of the *Quarterly Journal of Microscopical Science* there is a translation of Dr. Elias Metschnikoff's paper "On the Mesodermic Phagocytes of certain Vertebrates," originally published in the "*Biologisches Centralblatt*." Metschnikoff has shown elsewhere that certain amœboid cells in the tissues of the invertebrates have the power of ingesting and absorbing food particles. On experimenting with vertebrates, he found that the connective tissue cells had the same power, and that, in a batrachian larva about to metamorphose, the absorption of the tail was brought about by these cells, which he terms "phagocytes." At the beginning of the metamorphosis these amœboid connective-tissue cells collect round the muscles of the tail, and gradually devour their fibres. The fragments of muscle retain their structure for some time after ingestion, so that that process can be readily seen to take place, but gradually lose their stiration and break up into rounded strongly refracting globules.

In order to ascertain whether these "phagocytes" would absorb, and so eliminate from the system, injurious substances, Metschnikoff injected putrescent blood under the skin of a frog, so as to induce septicæmia. In a short time the white blood corpuscles (which are also included in the

term "phagocytes") were seen to contain both still and motile bacteria, and these organisms were especially abundant in the "hæmophagocytes" or white blood-corpuscles of the spleen. This fact, taken together with the probability that the spleen has no very important physiological function, since animals live without much apparent discomfort after its complete excision, seems to indicate a prophylactic function for the spleen, it being merely a protector against septic bodies such as bacteria, the removal of which from the body is its function.

To apply these facts to the process of inflammation. When inflammation was induced in the tail of a newt, the first phenomenon was the collection of connective-tissue "phagocytes" round the injured cells, followed by the passage of "hæmophagocytes" or white blood-corpuscles through the walls of neighbouring capillaries, both collecting apparently for the purpose of devouring and so removing the ruptured, dead and dying cells. In fact the essence of the whole inflammatory process may be said to be a conflict between the "phagocytes" and the septic material, whether the latter be a dead or dying cell, bacteria, or other foreign body. In the invertebrates, where connective-tissue cells are abundant, the vascular system does not participate in the process—only doing so among vertebrates, where the extra-vascular "phagocytes" are not sufficiently numerous to combat the injurious structures, a call for assistance being then given to the "hæmophagocytes." The first effect of irritation is on the connective-tissue "phagocytes," the changes produced in them subsequently influencing the capillary walls, and allowing the transit of the white corpuscles.

The theory has much to recommend it, being founded on logical, *a priori* grounds, and affording simple explanations for many obscure points in connection with inflammation. For instance it affords a simple explanation for the presence of the large numbers of connective-tissue and white blood corpuscles that have been observed in induced keratitis, and also it explains how in certain epidemic fevers—famine-fever for instance—numerous spirilla, etc., can exist in the blood of as yet unaffected individuals, without causing any symptoms of the epidemic. At the same time the theory is quite compatible with all definitely ascertained pathological facts, a circumstance which alone would give it considerable weight.