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THE SPLEEN AS A BACTERICIDE.

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RECENT progress in therapeutics has been marked in two directions, one in serum-therapy, the other, by means of what are known as the organic extracts. Of the latter it is necessary sharply to distinguish two classes. The first, including cerebrin, medullin, cardein, and the like, have a value at least doubtful; the second includes the administration of the thyroid gland for myxedema, and bone-marrow for pernicious anemia. The success of both of these forms of treatment is assured, and they rank among the most brilliant of recent achievements in medicine. In the case of both of the last-named methods, organs are used that without doubt act by supplying important constituents of the blood; in the case of marrow formative elements of the red blood-cells, in case of the thyroid some substance unknown, possibly a ferment, which, in a way also unknown, controls nutrition-processes.

The organs that have to do in especial with the blood are the thyroid, bone-marrow, and the spleen. Of the functions of the spleen little more is definitely known than was known a short time ago of the thyroid gland. It has been thought, however, to

be the birthplace of the white blood-cells. There are facts that point strongly to it as a possible agent in conferring immunity from certain diseases. Some authorities have held that the white blood-cells are the active agents in destroying bacteria that gain lodgment in the body. Whether this is true or not, it is certain that some persons live for years in very malarial regions without contracting the disease; that some people resist typhoid better than others, and that most men are exposed to tuberculous infection, and that when the disease is contracted, while some succumb, many do not. In all of these diseases—malaria, typhoid fever, acute tuberculosis, as well as pneumonia and some other germ-diseases—the spleen is markedly enlarged, as if from overstimulation in an effort to throw off the disease.

It is at least conceivable that the bacteria-killing substances, which undoubtedly exist in those diseases that admit of spontaneous cure, are elaborated in the spleen. The opinion that pulmonary tuberculosis and malaria are to a degree incompatible tends to confirm this view. Without discussing this question at length it is enough to say that Davidson (*Geographical Pathology*, vol. ii, p. 858), after giving many instances in support of the theory, summarizes as follows:

The facts, therefore, seem to establish two of the conclusions arrived at by Lombard, first, that consumptives are less numerous in those districts where malaria is dominant than in those where it is less prevalent; second, that this inverse relation is not entirely explained by differences in climate.

The foregoing lends some color to the supposition

that the malaria-soaked inhabitants of swampy regions possess an immunity from pulmonary tuberculosis. It suggests the thought that the spleen, enlarged and abnormally active from its long battle with malaria, more easily overcomes the inroads of the tubercle-bacillus. If a main function of the spleen is to furnish to the blood bactericides, the reason of our present ignorance of its function is apparent. Removal of the spleen is a rare operation, and statistics of the power of resistance to germ-diseases of persons so operated on are not procurable. That the spleen does contain substances that kill germs is beyond question. This fact is pointed out by Vaughan (THE MEDICAL NEWS, December 23, 1893), who says, "it is certain that the spleen contains a germicidal substance, but whether we can extract it by the method of Hankin we do not know." The question of extraction may be interesting chemically; clinically it might be as well to administer spleen by the mouth, or in the form of extract hypodermically. The former method is surprisingly successful in the case of thyroid and bone-marrow.

To sum up: In acute infectious diseases the spleen is enlarged, as if in an effort to combat the effect of the poison. Some men and certain entire species of animals possess immunity, and recovery takes place from these diseases by germicides produced in some part of the body; the spleen does without doubt contain germicides, and probably, therefore, elaborates them.

It is hoped that experiments with the administration of spleen in this class of diseases, particularly

in tuberculosis, malaria, and typhoid fever, may yield not only favorable results, but may throw additional light on the functions of the spleen analogous to that which has been thrown on those of the thyroid gland. Such experiments should be made as far as possible with the spleens of animals immune from the diseases experimented on.

While the foregoing considerations are purely theoretic, they are given in advance of actual experiment, with a view to induce others also to investigate the subject.

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