

surrounding villi, until, eventually, the poison becomes so concentrated that all resistance is overcome, and the follicle undergoes necrosis. The slow percolation of fluid through the follicles aids in their destruction, as it favours concentration and prolongs the period of contact.

As a corollary to this, it appears that ulceration of Peyer's patches is by no means an essential or necessary result of typhoid infection. For, if the base of supplies should be cut off, the bacteria already in the follicles might reasonably be expected to produce the same results, and disappear in the same manner as a like number of bacilli located in similar tissue in any other part of the body.

The treatment which I advocated in my first paper, and to which in the series of cases I have to report I adhered throughout, is based on this conception of the pathology of the disease. It consists, first, in eliminating as speedily as possible, both the main culture and toxine in the intestine, and also the poison held in solution in the body fluids throughout; second, in diluting as much as possible the toxine which is in contact with the tissues and in that way controlling to some extent its destructive or irritant defects, and third, in the use of substances which will destroy the bacilli still remaining in the intestine, or retard their rate of multiplication.

Elimination is accomplished by securing free and thorough evacuation of the bowels daily by the use of purgatives. This daily purgation, as much as seems necessary, keeping in view the evidence of toxæmia, is continued until the temperature becomes normal. There can scarcely be doubt about the possibility of clearing the intestine of the bacteria and poison which it contains. Argument to prove that point seems scarcely necessary. Since the evacuations constantly contain bacteria, and of necessity their generated poison, it follows that purgation must result in elimination of both, and, if the process is constantly repeated, there is a continued disappearance of bacteria and poison, which would otherwise be absorbed and carried throughout the body. In fact, by the agency of purgatives there is a frequent withdrawal of an additional dose of poison, which in the absence of any such procedure must surely have gone to increase the amount already in the tissues. But purgatives do

much more than simply empty the intestine. They at the same time cause a copious flow into the bowel, by their use the body-fluids are drained into the intestine. The amount which can be drained off in this way is very great, and in order that we may have some idea of it, let us calculate on the basis of Lauder Brunton's experiment, by which he demonstrated that in four hours, by injecting a solution of magnesia sulphate, he was able to produce a secretion almost equal to one drachm to every square inch of intestine acted upon. But we scarcely need to enter into a calculation, as the amount of fluid which follows the exhibition of a cathartic is sufficient evidence. The important point is that the body-fluids from which this secretion is derived hold in solution both the poison which has been absorbed from the culture in the intestine and that produced by the bacilli located in the various tissues of the body.

There are many somewhat indirectly beneficial results to be obtained by free elimination. The weakness of typhoid patients, which is of the same nature as that of a drunken man, disappears or grows less, keeping pace to a great degree with the lessened toxæmia. In a similar way, anorexia, nausea, or inability to digest and assimilate food, in every case, in my experience, grows less and less if elimination is free and continually secured. My patients have in every instance been able to take large quantities of nourishment, and without difficulty. Owing to the improved capacity in this respect, while on the one hand large quantities of fluid are constantly drained off, on the other hand this fluid is replaced by a large quantity frequently ingested and assimilated. So exhaustion from the frequent and copious evacuations is prevented. We may say that an exchange has simply been made. The body-fluid with its contained poison is replaced by a like quantity without that element.

In addition to the large quantity of food taken, I invariably direct that the patient be given water in large quantities at frequent intervals, with the two-fold object of aiding the elimination of poison by its diuretic and flushing action on the kidneys, and of keeping up the volume of body-fluid. Thus concentration of poison is prevented, which must inevitably result if the ingestion of fluid does not keep pace with its withdrawal. By preventing this we are following the plain teaching of pathology,